JULY 25, 1960

PAPER TRADE JOURNAL

Bowater Diversifies in N. A. by Opening New Board Mill in S. C.

Some Successes in One Mill's Finishing Improvement Program

One Man Handles Six Bleaching Stages at Swedish Sulphite Mill

Chief Factor in Making Paper of 50+ Years Life Expectancy is pH

Editorial Dept.
University Microfilms, Inc.
313 N. First St.
Ann Arbor, Mich.

Paper sculpture by Giuseppe Baggi

Pulp from Gottesman means...

TECHNICAL SERVICE!

Bleached and Unbleached Sulphite • Bleached Hardwood • Groundwood
Bleached, Semi-Bleached, and Unbleached Kraft

Established 1886

GOTTESMAN—CENTRAL NATIONAL ORGANIZATION

Gottesman & Company, Inc. • Central National Corporation
Central National Commercial Company, Inc.
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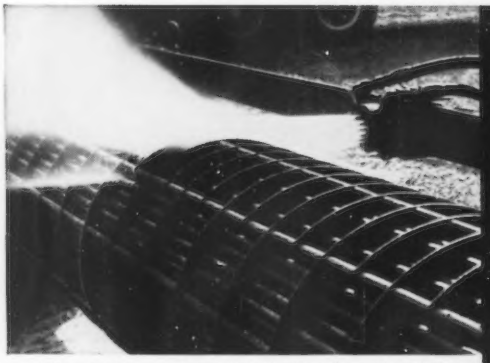
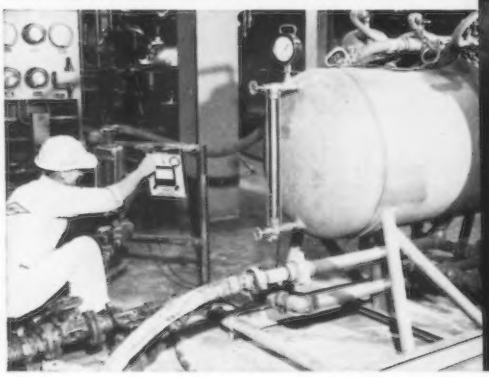
PULP PAPER EXPORT INC. WOOD PULP

Gottesman & Company Aktiebolag, Stockholm, Sweden • Central National-Gottesman Limited, London, England • Representatives in 55 Leading World Markets

A new mark for a nation-wide cleaning service . . . DOW



Jetting tool cleans tubes fouled with coke and asphalt.



New mobile foam-cleaning equipment cuts cleaning costs.

Cleaning missile lines and components requires tolerances as close as 150 microns.

DOW INDUSTRIAL SERVICE

Industrial Cleaning. Dow Industrial Service, now a separate division of The Dow Chemical Company, offers the only nation-wide chemical cleaning service for virtually all types of industrial processing equipment. This is an expansion of the cleaning service developed over the past 20 years. Dow is currently servicing entire plants as well as doing special cleaning jobs for both large and small companies.

Dow Industrial Service research in industrial chemical cleaning has developed specialized mobile equipment and techniques, some of which are pictured above. These highly efficient techniques are improving plant productivity and reducing equipment downtime in all industries using steam generators, condensers, heat exchangers, towers, water and product lines, water wells and tanks, or similar process equipment.

Product Sales and Service. The sale of specialized chemical products, scientifically formulated to be of use in specific industrial processes and to give the necessary technical service in their use, is the job of Product Sales and Service. Purifloc* N17 is an outstanding new flocculant cleared by USPHS for use in potable water.

Laboratory Service. Because of the rapid development of chemical products for the municipal and industrial waste and water treatment areas, Dow Industrial Service will take on the service-selling of those products. Also, a consulting laboratory service for municipal and industrial waste and water treatment is provided.

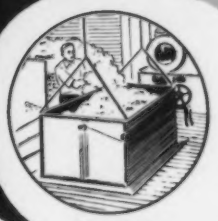
You'll find Dow Industrial Service offices and stations with specialized cleaning equipment and experienced personnel in all major industrial areas. For more information, write to Dow Industrial Service, 20575 Center Ridge Road, Cleveland 16, Ohio. *TRADEMARK

DOW INDUSTRIAL SERVICE DOW *Division of THE DOW CHEMICAL COMPANY*

felt facts

UNIFORMITY IN YOUR FELTS depends on QUALITY CONTROL

ALL ALONG THE LINE...



BLENDING

Felt uniformity means the same length, width, drainage and finish—felt after felt. This uniformity is the key to your successful high speed, top quality production. Albany Felt is proud of its record of providing this uniformity felt after felt, year after year, for mills throughout the country.

This is not by chance—for felt making at Albany Felt is carried on under the strictest quality controls in the industry. With *120 check points,* including those in the blending of wool and synthetic fibers, spinning, weaving and finishing, a vigilant watch is kept on each operation by our Quality Control Department.

All along the line . . . the manufacture of your Albany Felt is a custom process, under the most rigid quality controls.

UNIFORMITY IS THE RESULT. TOP PERFORMANCE ON YOUR MACHINE IS THE PROOF.

SPINNING

WEAVING

FINAL INSPECTION

LABORATORY

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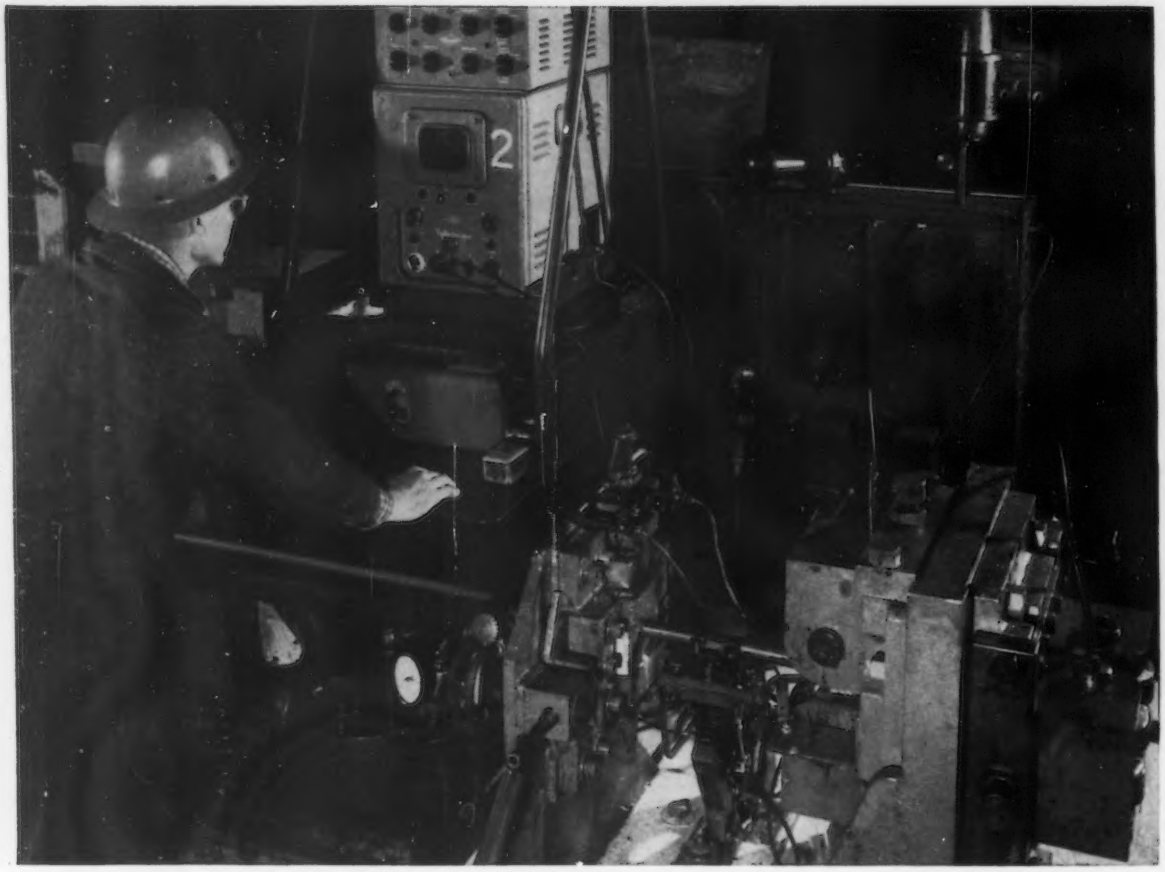
TALK IT OVER WITH YOUR ALBANY FELT SALES ENGINEER

AF

ALBANY FELT COMPANY

ALBANY, N. Y.

The World's Largest Manufacturer of Paper Machine Felts



How to inspect electric welded tubing with ultrasonic sound waves

National Tube tests all USS National Electric-Resistance Welded Pressure Tubing with ultrasonic sound waves. As the tubing slides directly over a ground quartz crystal, electrical pulses are focused on the weld area. The crystal changes these pulses into ultrasonic vibrations which bounce off the the weld and reflect its strength or weakness. The vibrations are speared by the crystal, converted back into electrical energy, and floated across an oscilloscope screen.

If a bad weld is reflected, the electrical current dances wildly on the screen and triggers an alarm system. The crooked pattern is pen-recorded on a graph, a frog-voiced horn croaks loudly, and the tubing is squirted with black paint to mark the defect.

In case the ultrasonic unit breaks down, a red-faced dome light automatically flashes, revolves and winks at the weld inspector. This blushing signal tells him that the unit needs to be checked. It's added insurance that every length of pressure tubing is completely tested before it leaves the plant.

Our inspection techniques are rigid. But they help us develop a high quality product for use in applications such as boilers, heat exchangers, condensers, superheaters, economizers and other types of heat transfer equipment.

USS National Electric Welded Pressure Tubing is available in sizes ½" O.D. to 5½" O.D. inclusive, in walls from .035" to .250", and in lengths up to 44 feet. Consider USS National Electric Welded Tubing for your next installation. It's stocked by National Tube Distributors all over the country. Our trained Mill Service Force is also available for field consultation. Write National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS and National are registered trademarks

National Tube Division of United States Steel

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United States Steel Supply Division
United States Steel Export Company, New York

This mark tells you a product is made of modern, dependable Steel.

PAPER TRADE JOURNAL

PUBLISHED WEEKLY SINCE 1872

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Week of July 25, 1960—Vol. 144, No. 30

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REMEMBER THESE DATES

August 22-24. TAPPI Alkaline Pulping Conference, Multnomah Hotel, Portland, Ore.

September 6-9. CPPA Summer Meeting, Technical Section, Banff Springs Hotel, Banff, Alberta, Canada.

September 18-21, NPTA Semi-Annual Convention, Conrad Hilton Hotel, Chicago, Ill.

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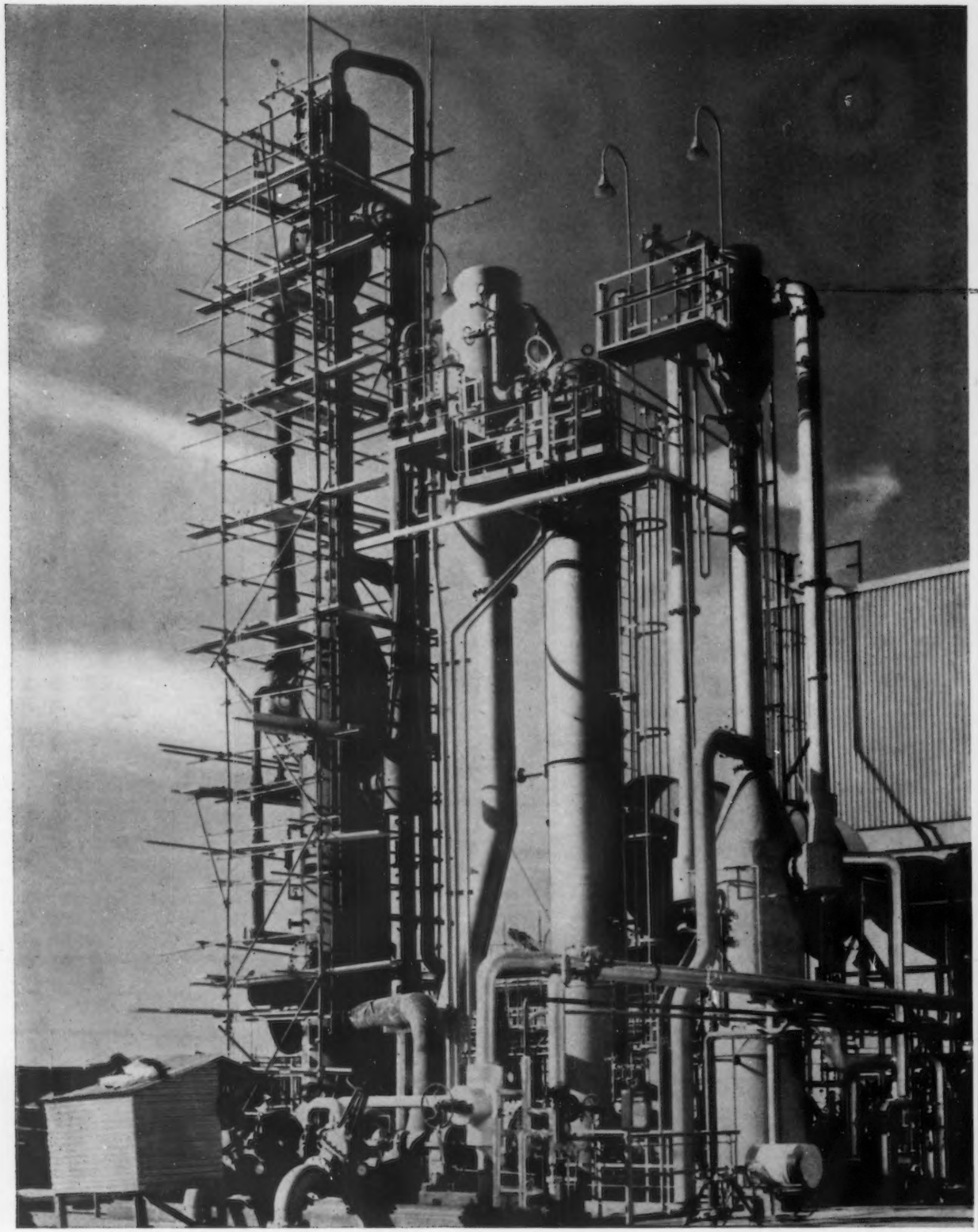

PETROTHENE® RESINS FOR FILM AND COATING. Capacity of this U.S.I. plant at Houston, Tex., is being expanded to 200 million pounds of polyethylene per year. U.S.I. also produces 100 million pounds of polyethylene per year at its Tuscola, Ill., plant complex.

U.S.I.'s MANY PLANTS PROVIDE AMPLE SUPPLIES OF PAPER CHEMICALS

for pulping
for converting
for packaging

From chlorine and caustic for bleaching pulp—to polyethylene resins for coating paper and board—U.S.I. is a dependable source of chemical products for the paper industry.

With two chlorine and caustic plants at Huntsville, Alabama—conveniently located in relation to a large number of pulp and paper mills—U.S.I. can offer rapid delivery and prompt technical assistance on these products. Liquid chlorine is available in tankcars. Commercial grade 50% caustic soda is shipped in tankcars, tank trucks, barges.

Two other important paper chemicals—sodium peroxide and ammonia—are also available from U.S.I. Sodium peroxide is produced at Ashtabula, Ohio; ammonia at Tuscola, Illinois.

With U.S.I.'s latest polyethylene resin plant expansion at Houston, Texas—and facilities at Tuscola, Illinois—the company's total polyethylene capacity will soon reach 300 million pounds per year. This will make U.S.I. the world's second largest producer.

As part of the company's program to assist polyethylene customers, U.S.I. has come up with significant developments in resins for the paper industry. For example, PETROTHENE® 205-15—one of four new U.S.I. resins for paper coating—exhibits greater greaseproofness at any given coating weight than other resins of similar melt index and density. All four resins are tailored for high adhesion, and reduced neck-in, smoking and polymer build-up at the die.

U.S.I. has also pioneered the new technique for producing crystal-clear cast polyethylene film, and has just released new resins for this purpose. More and more converters are packaging with polyethylene now that the clarity problem has been solved, because of the enhanced shelf life which this film gives to paper products.

U.S.I. has a pulp-to-package interest in the paper industry's growth. To take advantage of our research and development work, large capacity, prompt technical service, write or call your nearest U.S.I. sales office, or company headquarters in New York.

AMMONIA is made at this U.S.I. plant at Tuscola, Ill. Polyethylene resins are also produced at Tuscola by U.S.I.

CHLORINE & CAUSTIC SODA. One of the two U.S.I. plants at Huntsville, Ala., producing these basic chemicals for the pulp and paper industry.

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers and Chemical Corp.
99 Park Ave., New York 16, N. Y.
Branches in Principal Cities

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smoothest distributor rectifier roll coating ever created by man

So smooth that it is even used to cover stainless rolls. GUARDITE flows around corners of holes and covers any roughness from machining. GUARDITE, because of its outstanding corrosion resistance and long lasting surface, permits more mills to have low cost steel shells coated with this new material. Gone are problems of looseness and the covers peeling-off. On the machine, you will find GUARDITE performs properly, because its smoothness does not tolerate stock pick-up.

For the new GUARDITE Roll catalog page containing complete technical information, contact your S-W sales engineer, or write to:

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GUARDITE IS NEW
and
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Seattle, Washington
Portland, Oregon
Port Coquitlam, British Columbia, Canada

Trends

P, P & B Exports Continue Rise

Pulp and paper exports continue to run well in excess of 1959, according to preliminary data from the Bureau of the Census. Woodpulp exports were up 58% for the first five months against the comparable period last year, while paper, board and products were higher by 10%.

Folding Boxes Show 2% Gain

Shipments of folding boxes during the first six months of 1960 topped by 2.2% the dollar volume recorded in the first half of last year, according to the Folding Paper Box Ass'n. Tonnage of shipments during this period trailed the first half of last year by three-tenths of one per cent. June shipments were 1.2% ahead of last year in dollar volume and 1% behind in tonnage.

Imports European Pulp Falling

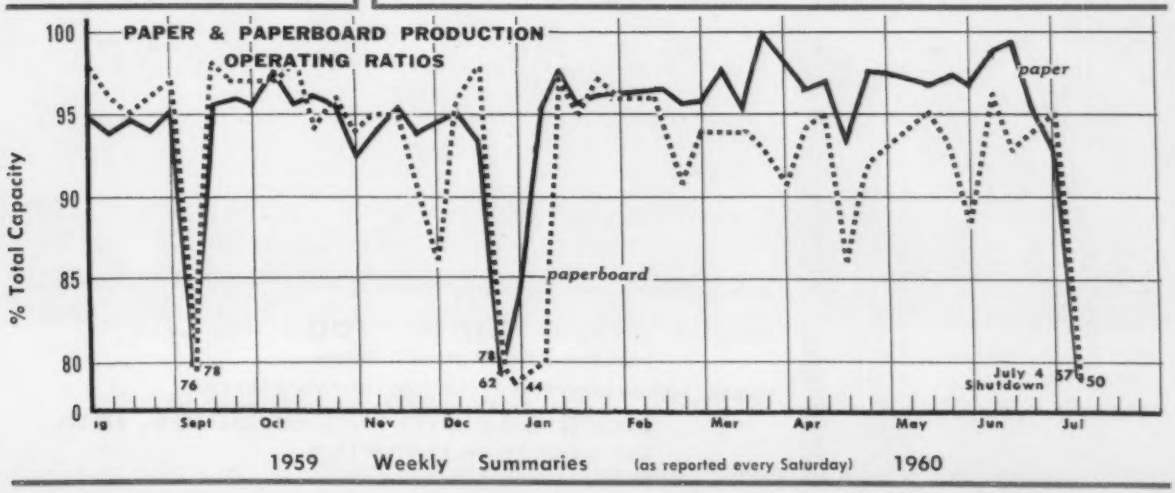
American imports of foreign pulp for January-May 1960 compared with same period last year are: Canada +2%, Sweden —37%, Finland —8% and Norway —2%, according to just released data from the Bureau of Census.

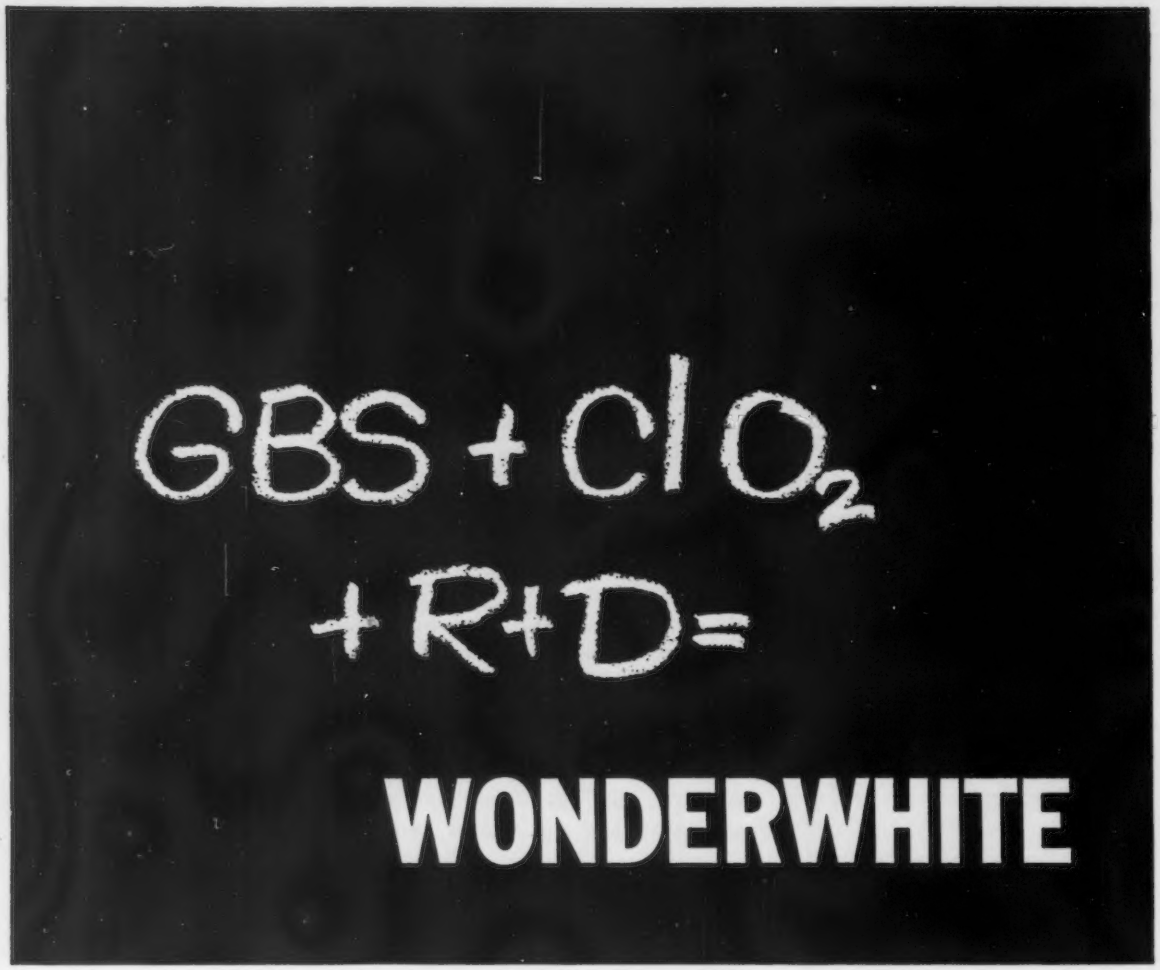
Dissolving Pulp Prices Off

Rayon production in the first half was 16% below the like period in 1959. The result of this further decline in an already over-capacity market has been dissolving pulp price reductions averaging around $10 a ton for most grades.

Canadian Wage Contract Picture

New union contracts in the Canadian industry are expected to add around $1.50 a ton to newsprint costs, according to the Newsprint Information Committee. Basic rate for newsprint mill workers, hitherto $1.78 in Eastern Canada, is now 11 cents higher in many mills. It will go up four cents more November 1st. The average wage, $2.20 prior to May, will become about $2.35. A new one-year contract effective July 1 for British Columbia specifies a 4% rise in wages and benefits. The Pacific Coast base rate now becomes $2.03 and the average $2.45 an hour.





Gaspesia Bleached Sulphite *plus* Chlorine Dioxide *plus* Research and Development equal WONDERWHITE

You have been hearing a great deal about this new Gaspesia Bleached Sulphite Pulp with Chlorine Dioxide which is now coming from our mill in Quebec. We call it WONDERWHITE because performance records are topping even our laboratories' predictions.

Our Research and Development give WONDERWHITE a strength surpassing that of any other sulphite now on the market. At the same time, WONDERWHITE retains the excellent formation plus printing characteristics and excellent opacity of a good spruce sulphite.

Another plus: Chlorine Dioxide gives WONDERWHITE unsurpassed brightness and guarantees the highest degree of cleanliness.

Order a trial shipment—and let WONDERWHITE tell its own story.

GASPESIA SULPHITE COMPANY LTD.
CHANDLER, QUEBEC, CANADA

SOLD BY: **Anglo Paper Products, Ltd.**
2055 Peel Street, Montreal 2, Quebec

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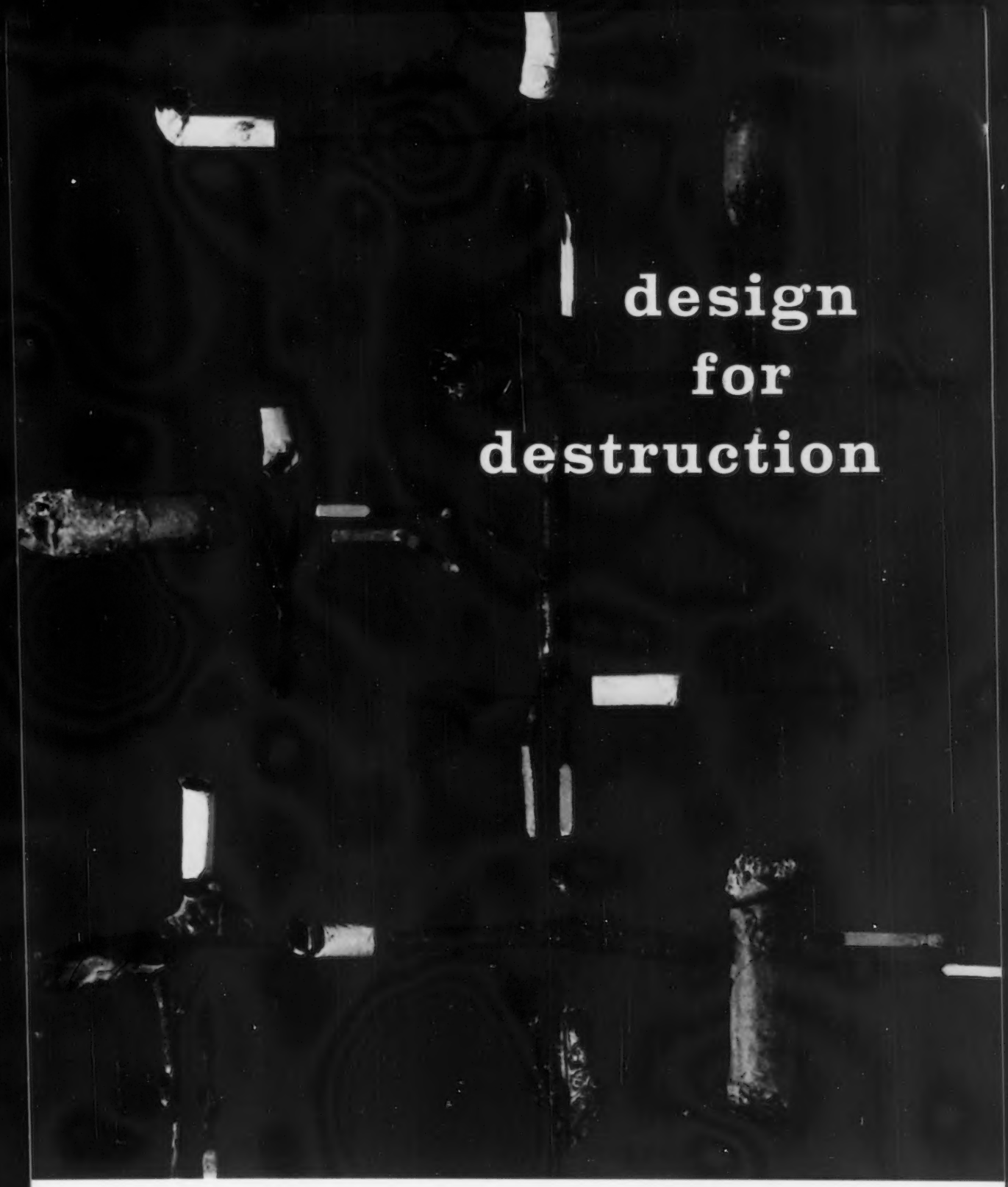
Northeastern Paper Sales, Inc.
400 Madison Avenue, New York 17, N.Y.
20 North Wacker Drive, Chicago 6, Ill.

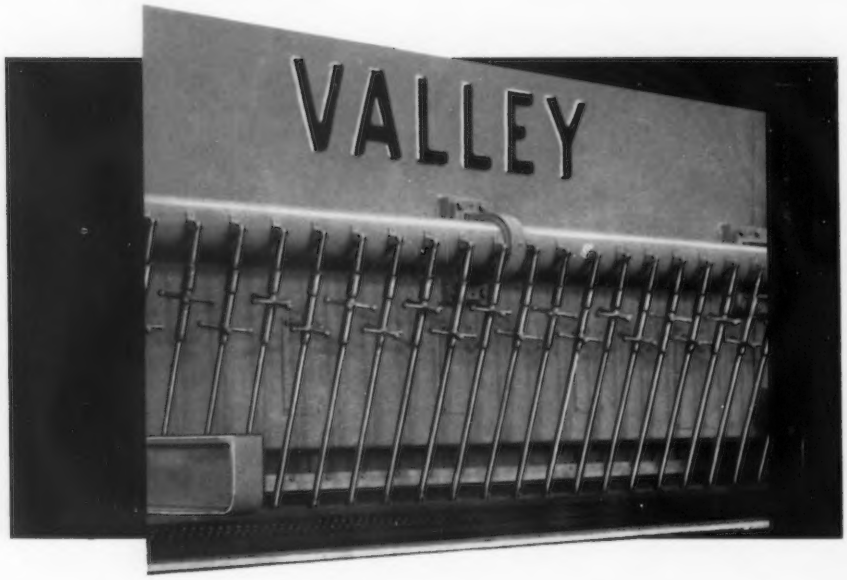


you can help prevent forest fires

Weyerhaeuser Company

Pulp and Paperboard Division

the sign of QUALITY



29 different* paper mills will start up NEW stock entrance equipment in 1960...

by... VALLEY

*DOES NOT INCLUDE TWO OR MORE INSTALLATIONS IN ONE MILL

Consult **VALLEY IRON WORKS CORPORATION**

Subsidiary of Allis-Chalmers Manufacturing Company
Appleton, Wisconsin

West Coast Representative: E. A. Berry, P.O. Box 958, Longview, Washington
Canadian Representative: Pulp and Paper Mill Association Ltd., P.O. Box 850, Station "O", Montreal 9, Quebec

THE TIN CANS THAT TURNED INTO GOLD

(Another Diamond Alkali Success Story about Caustic Soda)

A Scrap Dealer was having trouble deciding whether or not to go into the steel detinning business. He wasn't even sure a practical reclaiming method had been perfected.

He called the Diamond technical man and gave him the problem. The problem was referred to the Diamond laboratories.

Not only was this man given a formula for detinning with caustic soda, but also a detailed flow chart of the process and tips on how best to market the reclaimed tin.

If *you* use caustic soda, get to know the Diamond technical man. He saves customers money on shipping and handling problems, helps with their process problems. What he can't handle himself, he'll refer to the Diamond Research Center.

There is no finer caustic soda than Diamond's. There is no better service than Diamond's. No matter where your plant is located, you can get fast, economical delivery from one of Diamond's four strategically located producing plants. By truckloads, carloads or bargeloads.

Call any Diamond Sales Office: Chicago, Cincinnati, Cleveland, Houston, Memphis, New York, Philadelphia, Pittsburgh, St. Louis. DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

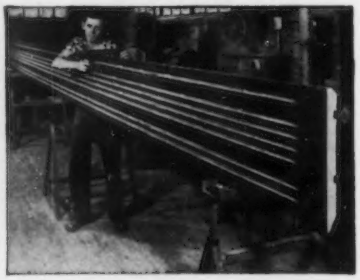
Diamond Chemicals®

REPORT FROM RYERSON
on Services and Products in Stock

In addition to the products shown below, you can call on Ryerson for flame-cut steel shapes, fabricated steel for reinforced concrete or steel frame construction—many other products and services. And equally important are the specialists who carry out the Ryerson quality control program —see that customers specifications are *exactly* met, that every order is correctly filled and promptly delivered. As a result you get unequalled service and certified quality when your company calls Ryerson for steel, aluminum, industrial plastics and machinery.

STAINLESS STEEL—Allegheny stainless in over 2,221 sizes, shapes, types, finishes: sheets, plates, bars, pipe, etc.

INDUSTRIAL PLASTICS—PVC pipe, fittings, sheets and rods, rigid Kralastic and flexible polyethylene pipe.

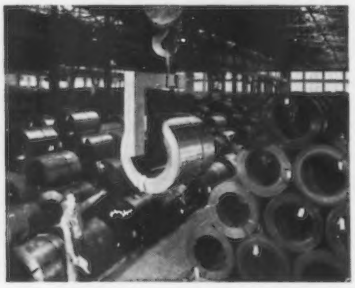


RYERTEX COVERS & BEARINGS
Suction box covers, bearings, etc. of low friction phenolic compositon.

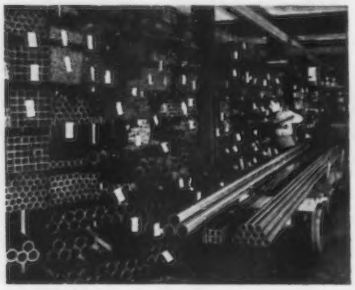
CARBON STEEL & ALLOY BARS
Most complete range of types, shapes and sizes as well as largest tonnage.

STRUCTURALS—I-beams, H-beams, channels, angles, tees and zees—all high quality steel to ASTM spec. A-7.

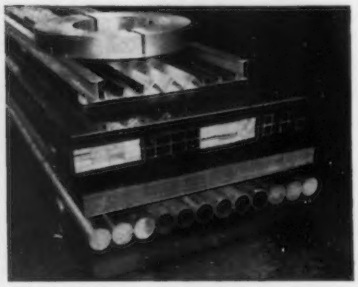
PLATES—14 types including special low carbon steel plates for forming and welding, leaded New E-Z-Cut, etc.



SHEET STEEL & STRIP—More than 20 different types in pattern sizes, cut-to-order sizes, strip coils, etc.



TUBING—Seamless and welded steel tubing—mechanical tubing, fluid line, pump cylinder and structural tubing.



ALUMINUM—At many Ryerson plants —sheets, coils, plates, bars, tubing, architectural and structural shapes, etc.

METALOGICS
RYERSON PLUS VALUES

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

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Joseph T. Ryerson & Son, Inc., Member of the INLAND® Steel Family

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PAPER TRADE JOURNAL

WEEK OF JULY 25, 1960

TECHNICAL CENTER,
ST. REGIS PAPER COMPANY
CLARKSTOWN, N.Y.

St. Regis to Build Nyack Research Center

A new three-million dollar Technical Center will be built by St. Regis Paper Co. in order "to make more effective use of new technology in the company's operations and to implement continuing programs of diversification and growth." Construction of the new Technical Center is scheduled to begin late this year at Clarkstown, N. Y. (four miles west of Nyack).

The Technical Center will have an area of 60,000 square feet comprised of offices, laboratories, a technical library, cafeteria, and supporting services. It will accommodate about 180 persons. In addition to the research and development department, technical services and control and technical planning departments will be located at the Center. Programs to be undertaken will relate to materials utilization, printing papers, kraft pulp, paper and board; bags, packaging, plastics and other products.

When the Technical Center is completed, it will include those research and development activities of a broad nature which are now being conducted at several other centers. However, certain specific programs will continue to be conducted at the locations concerned. St. Regis will retain a kraft pulp and papermaking development group at Pensacola, technical services laboratories at Pensacola and Pittsburgh, and quality control representatives will remain at the various mill sites. Administrative personnel in technical planning and technical services will be located at the St. Regis office in New York.

Dr. Kenneth A. Arnold is director of research and development; Dr. Robert W. Reed, director of technical services and control; and Thomas A. Hewson, director of technical planning.

Price Bros. Awards Kraft Mill Contract

Price Bros. & Co. has awarded a construction contract for its proposed kraft pulp and paper mill at Kenogami, Que. The project, to cost $22 million, will be built by E. G. M. Cope Co. Price Bros. already has a 1000-ton-a-day newsprint mill at Kenogami with attendant groundwood and sulphite pulping facilities.

New Alberta Mill Planned

Wildwood Pulp Products, Ltd., has obtained a 25,000-acre crown lease from the Alberta government to provide pulpwood for a pulp and board mill at Wildwood, 70 miles west of Edmonton, Alta.

The mill will have a capacity of 25 tons of pulp a day. Products will include cardboard, building board, etc.

Under the agreement with the province, the mill is to be completed by August 1, 1961.

Company directors are: Myron Nikoloyuk, Link Stephenssen, Walter Williamson, all of Wildwood; Stanley G. Maertz, school principal; Gerrard D. Lavallee, Edmonton barrister.

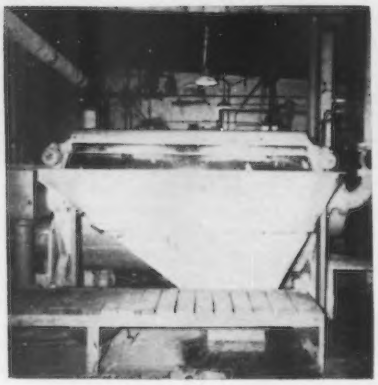
Paper and Paper Board Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending July 9, 1960, at 56.6 per cent compared with 89.1 per cent revised, for the preceding week. The ratio was 71.5 per cent for the corresponding week a year ago.

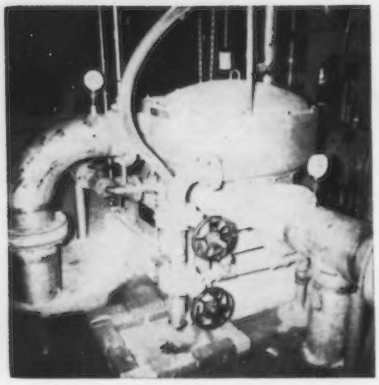
The capacity base on which the paper operating ratios are computed was raised by 6½ per cent as of the week ending July 9, 1960, to take into account capacity increases that have occurred during the first half of 1960.

The National Paperboard Association reported the paperboard production ratio for the week ending July 9, 1960, at 50 per cent, compared with 90 per cent for the preceding week and 56 per cent for the corresponding week a year ago.

(Detailed Statistics on page 41)



New Bird Save-All on white water.



New Bird Centriscreen on No. 7 P.M.

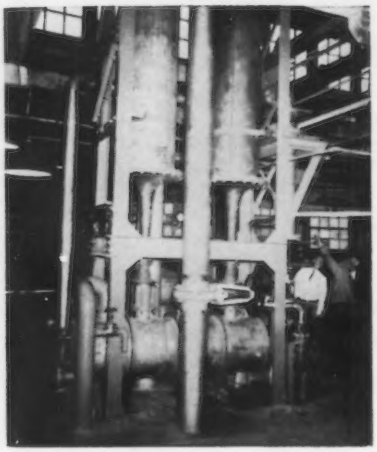
Hamersley Adds Improvements To No. 7 Machine

The Hamersley Mfg. Co., Garfield, N. J., has installed several new pieces of equipment during the past few months in connection with No. 7 paper machine. These include a save-all made by Bird Machine Co., a "Centriscreen" also made by Bird and a complete new "Vorvac" system produced by Nichols Engineering & Research Corp.

The Vorvac equipment, and the Centriscreen, together with all the necessary stock lines are of stainless steel construction. All stock pumps for the system were fabricated of bronze by the Warren Pump Co.

The result of these improvements has been a cleaner sheet and, with air removal, a more even formation and smoother surface. Also the possibility of pin holes is said to have been reduced.

The company is now making super tracing papers and other grades it has not been able to manufacture previously. Further modernization is planned during the summer vacation shut-down period.



Vorvac System removes air from stock.

Advance Registration Suggested for Alkaline Pulping Conference

The 14th Alkaline Pulping Conference, sponsored by TAPPI will be held August 22 through 24, at the Multnomah Hotel, Portland, Ore.

According to the local arrangements chairman, A. H. Wickett, Weyerhaeuser Co., Longview, Wash., it is necessary to register in advance of this conference before you can get a hotel reservation. Pre-registration forms, including hotel arrangements, may be obtained from TAPPI, 360 Lexington Ave., New York 17, N. Y. Pre-registration deadline is August 1.

The Tentative Program follows.

Alkaline Pulping Session I

"An Evaluation of Certain Laboratory Pulping Methods"—E. F. Thode, J. R. Peckham and E. J. Daleski, The Institute of Paper Chemistry.

"The Effects of Outside Storage on Slash Pine Chips in the South"—C. W. Rothrock, St. Regis Paper Co., Pensacola, Fla., W. R. Smith, Southeastern Forest Experiment Station, and R. M. Lindgren, U. S. Forest Products Laboratory.

"Experience with the Upflow Continuous Digester"—R. H. Rasch, Hammermill Paper Co., and L. A. Carlsmith, IMPCO.

"Diagnosis of Deposits of Pulp Mill Origin"—R. T. Mashburn, P. D. Applegate, and H. R. Miller, Hercules Powder Co.

"Abatement of Air and Water Pollution"—V. W. Bacon, Northwest Pulp & Paper Association.

Alkaline Pulping Session II

"Modern Design for Kraft Recovery Dissolving Tanks"—(Author to be announced).

"Interaction of Smelt and Water"—H. P. Markant, C. E. Rogers, and H. Dluehosh, Babcock & Wilcox Co.

"Experiences with the Production of Chlorine Dioxide"—T. C. Payne and B. W. Smith, International Paper Co.

"Operational Experience with Continuous Calcium Hypochlorite Systems"—J. W. Klein, Longview Fibre Co. and H. S. Fisher, Pennsalt Chemicals Corp.

Alkaline Pulping Session III

Panel discussion on High Yield Kraft Pulping—Panel to be composed of representatives of the following mills: Container Corp., Fernandina Beach, Fla.; George Kraft Co., Rome, Ga.; Continental Can Co., Savannah, Ga.; St. Joe Paper Co., Port St. Joe, Fla.; St. Lawrence Paper Corp., Montreal, Quebec.; Bathurst Pulp and Paper Co., Bathurst, N. B.; and St. Regis Paper Co., Jacksonville, Fla.

Sulphite Pulping

"Multistage Sulphite Pulping of Jack Pine and Mixed Oaks"—E. L. Keller, N. Sanyer, and G. H. Chidester, U. S. Forest Products Laboratory.

"Continuous Sodium Sulphite Cooking of Soft Woods"—C. A. Richardson, Blandin Paper Co.

"High Yield Sulphite Pulping (exact title unknown)—R. Strapp, Pt. Claire, Que., Can. Affiliated with Sprout Waldron.

"High Yield Magnefite Pulping"—P. E. Trout, Waldorf Paper Products Co.

Ladies' Program (Correction)

It has been previously announced that the Ladies' program was to include a trip to Timberline Lodge on Mount Rainier. This should have read "Mount Hood."

Mount Hood is located only a short distance from Portland allowing a pleasant trip through scenic splendor of tall evergreen Douglas firs and hemlocks. As the name implies, the lodge is located at the timberline about a mile above sea level. This

Showing some of the 280 Bird Cycleans on the job at Publishers Paper Co., Oregon City, on unbleached sulphite. These are 4" units (available with patented, non-plugging automatic purge tips); Cycleans also come in 7" and 12" sizes to meet a wide range of capacity requirements.

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You've acquired a powerful sales as well as production advantage when you put your stock through Bird Cyclean pressure drop cleaning units.

Cycleaned paper gives you a definite competitive advantage over papers made from stock without benefit of *cycleaning*.

Cycleaned stock means better fibre hydration, fewer breaks, fewer wash-ups, increased wire life, increased machine output — production benefits that more than pay for the Cycleans.

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location affords a panoramic view to the south of the Cascade Range. Some of the other snow capped mountains include Mount Jefferson, The Histers and Three-Fingered Jack.

Last Chance to Register For Statistics Course

North Carolina State College indicates that applications for the 9th Statistics Course, sponsored jointly by TAPPI and the Technical Section, CPPA, are rapidly approaching the available registration facilities. A few vacancies still exist for both the basic and advanced courses which will be held at Brevard College, Brevard, N. C., August 8 through 19, 1960, and conducted by the Institute of Statistics, North Carolina State College, Raleigh, N. C.

Since the courses begin on August 8, anyone interested in participating should act quickly and request registration forms and information from R. J. Hader, The Institute of Statistics, N. C. State College, Raleigh, N. C.

The fee for either the basic or the advanced section of the course is $275, covering board and room for the two-week period, textbook, and other materials. Both courses of instruction will be held concurrently.

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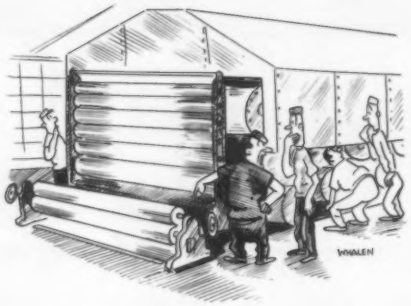

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Howard Paper Merges With Orchard Paper

Howard Paper Co. of Atlanta, Ga., has merged with the Orchard Paper Co. of St. Louis, Mo., and become a wholly owned subsidiary of the St. Louis firm, Howard L. Baer, president of the Atlanta company, has disclosed.

Howard is a wholesaler of paper products. Orchard is a manufacturer and converter of paper products.

Mr. Baer also announced the acquisition by Howard of the inventory and sales-service organization of the Youngblood Corp. of Atlanta, Ga. Youngblood was a distributor of fine and printing papers. It will be continued as the fine paper division of Howard.

Maine Pulp and Paper Summer Institute Opens

The first three-week session of the Summer Institute for the Pulp and Paper Industry at the University of Maine opened July 11 with 22 men representing 17 companies and organizations registered.

The three-week program from July 11-29 is concerned with pulp technology and all phases of pulp manufacture and testing. The second three-week session, August 1-19, will involve paper technology, manufacturing and testing.

The Institute, which is sponsored by the university and by the University of Maine Pulp and Paper Foundation, is offered primarily to broaden the technical and management training of key personnel in the industry.

Kimberly-Clark Plans 40 Million Program

The Kimberly-Clark Corp. has disclosed that it plans to spend some 40 million dollars for capital improvements in the current fiscal year, which ends April 30, 1961.

The over-all figure represents an increase of about 15 million over the average 25 million dollar annual capital outlay spent over the last five years. It marks an even sharper rise over the 16 million spent for capital improvements in the last fiscal year, which ended April 30.

PAPER PEOPLE

H. W. Miller

Miller Advanced At Fraser Paper

W. A. Ketchen, vice president, technical services, Fraser Paper, Ltd., Madawaska, Me., has announced the appointment of H. W. Miller as assistant divisional chemist, succeeding N. L. Martin who resigned.

Mr. Miller worked for St. Joe Paper Co., Port St. Joe, Fla., and Tonawanda Boxboard Co., Tonawanda, N. Y. He attended New York State College of Forestry, Syracuse University, and was graduated with a B.S. degree in pulp and paper.

In 1941, Mr. Miller joined the technical department of Fraser Paper, Ltd. From 1943 to 1946 he was with the Signal Corps of the U.S. Army. He returned to Frasers in June 1946 when he resumed his duties in the technical department.

Veneman Named Sulphite Bond Group Head

G. E. Veneman, vice president and director of sales for Nekoosa-Edwards Paper Co., has been elected chairman of the Sulphite Bond Group of the Writing Paper Manufacturers Ass'n. and concurrently a vice president of the association.

He previously was vice chairman of the Sulphite Bond Group and also is a member of the association's finance committee. Mr. Veneman's election fills vacancies created by the recent death of H. W. Suter, Jr., vice president of Champion Paper & Fibre Co.

Tennessee River P&P Adds Four to Staff

Tennessee River Pulp and Paper Co. has announced the following recent additions to its staff.

Frank A. Jensen has joined the company as paper mill superintendent. He has been in the industry almost 40 years, the last 23 as either foreman or superintendent in mills in the South. Mr. Jensen was with Camp Manufacturing, Franklin, Va., from 1937 to 1940; Hollingsworth and Whitney, Mobile, Ala., for the next eight years; St. Mary's Kraft Co.; Hamilton Paper Co.; and, most recently, Southern Chemical Cotton Co., Chattanooga, Tenn.

John Henry Morris has been named assistant paper mill superintendent. After six years with International Paper Co. in Georgetown, S. C., he joined Georgia Kraft Co. for its start-up in 1948. Beginning at Macon as third hand, he has been tour foreman for the past six years.

Leon G. Smith is purchasing and traffic manager. After his discharge from the Navy in 1946, he began his 14-year career with Armstrong Cork Co. in Pensacola, Fla. At the time he left Armstrong Cork he was production planning manager-purchasing agent-traffic manager.

N. Wesley Sentell is Tennessee River's assistant wood and land manager. He has a forestry degree from Louisiana State University. After 12 years with the U.S. Forest Service in several locations, he joined Southern Advance Bag and Paper Co. in 1946 as chief forester. Mr. Sentell was with Robert Gair and Continental Can Co. as a result of subsequent mergers, serving as engineering development and procurement forester with Continental Can before joining Tennessee River Pulp and Paper Co.

Sonoco Board Honors Dunlap on Retirement

The Board of Directors of Sonoco Products Co. in a special meeting presented C. K. Dunlap with a handsome silver punch bowl. Mr. Dunlap retired from Sonoco on April 1 after 44 years of service. At the time of his retirement Mr. Dunlap was a vice president of the company. He was considered by many as the "Dean of the Paper Converting Industry," in that he designed and patented more

PUMPAGE

Goulds reports on trends in pulp and paper

WASTING POWER AT THE THROTTLE VALVE? When pumps are too big for heads and capacity, power from the oversize motors goes to waste at the throttle valve. Many mills have saved themselves money by using our Bulletin 782.1, *Application Data for pumps handling paper stock suspensions*. Concisely cached between the covers are: 1. Friction curves of paper stock suspensions in pipes, elbows and fittings. 2. Pump selection data. 3. Head-capacity correction. Write for your copy at any time.

PAPER PRODUCTION INCREASED 400% IN 35 YEARS. Production of paper and paperboard reached a new high in this year's first quarter, according to *Paper Trade Journal*. The estimated 8,800,000 tons is only 2% less than the paper produced in all of 1935.

WHEN MOTHER HUBBARD RAN A PAPER MILL. One day she needed an impeller to repair a fan pump. But the cupboard was bare. Mother H. wailed and wept while she watched a series of machines shut down. She made frantic phone calls. She paid the penalty of air freight delivery. We think a mill should never have a bare cupboard. On the other hand, there is no need for it to stock everything. As for us, we try to keep *our* shelves full so we can fill *yours* on short notice.

THE SWITCH STUCK, THE PUMP SEIZED. A capsule tragedy. And it really happened while starting a new pump. They were jogging the motor to check its rotation. Trouble was, they jogged *after* they connected the coupling—and created an adhesive condition. We consider proper methods of starting a new pump so important that we have written a data section on it. In a pump man's language, this section gives fast facts on checking procedures and corrective steps. It also includes valuable information on proper pump foundation and pump alignment. For your copy, just write us asking for Data Section 770.8.

OBSERVATIONS

ON THE RIGHT TIME TO BUY A NEW PUMP

By Phil Olmstead, Chief Engineer, Goulds Pumps

If your *needs* have changed since you installed your present pump, if *efficiency points* have changed because deposits have built up in your piping, if your present pump is *frequently under repair*—chances are, you need a new pump.

That's a pretty good rule of thumb—but you can actually *calculate* your need for a new pump in the dollars-and-cents saving it will yield.

All you do is apply a simple formula to find the horsepower saved by installing a new pump. From this figure you derive your saving in kilowatt-hours. One of our application engineers will gladly work out this formula with you. Then you can easily discover how much a new pump would save you over a year's time.

The most economical pump you can put on *any* job is the one that fits your present needs best.

Goulds Pumps, Inc., Dept. PT-70, Seneca Falls, N. Y.

GOULDS PUMPS

than 40 machines used in the conversion of paper to cones, tubes and cores, which are the principal products of Sonoco.

Burnside Joins Keyes West Coast Sales Staff

Willet Caldwell Burnside of Sunnydale, Calif., has joined the West Coast sales staff of Keyes Fibre Co., Waterville, Me. He will cover the San Francisco area for Keyes.

Carlson Retires From Scott Paper Post

John M. Carlson, pulp mill production manager for Scott Paper Co., Everett, Wash., retired June 30.

Mr. Carlson joined the Everett mill of Puget Sound Pulp and Timber Co. (later Soundview Pulp Co.) in 1930, having considerable experience in the industry prior to that time.

Durkee Joins Knowlton As Technical Assistant

Myron C. Durkee, formerly with Nicolet Industries, Inc., Norristown, Pa., a paper-producing concern, has joined Knowlton Brothers, Watertown, N. Y., as technical assistant to the vice president in charge of production.

OBITUARIES

W. Clare Monaghan, 53, superintendent of the Aetna Paper Co. division of Howard Paper Mills, Inc., died July 1.

Mr. Monaghan was associated with Aetna 27 years, the last six years as superintendent. Born at Alpena, Mich., he resided here most of his life.

Frank G. French, 62, president of French Paper Co., Niles, Mich., since 1931 died July 9, in Niles of a heart attack.

Chris W. Liebel, 51, assistant sales manager of the Mead Container Corp., Norwood, Ohio, died July 10 at the Ryland Hills Country Club, Ryland, Ky.

Mr. Liebel was a former retail advertising salesman for The Cincinnati Post.

BLACK-CLAWSON

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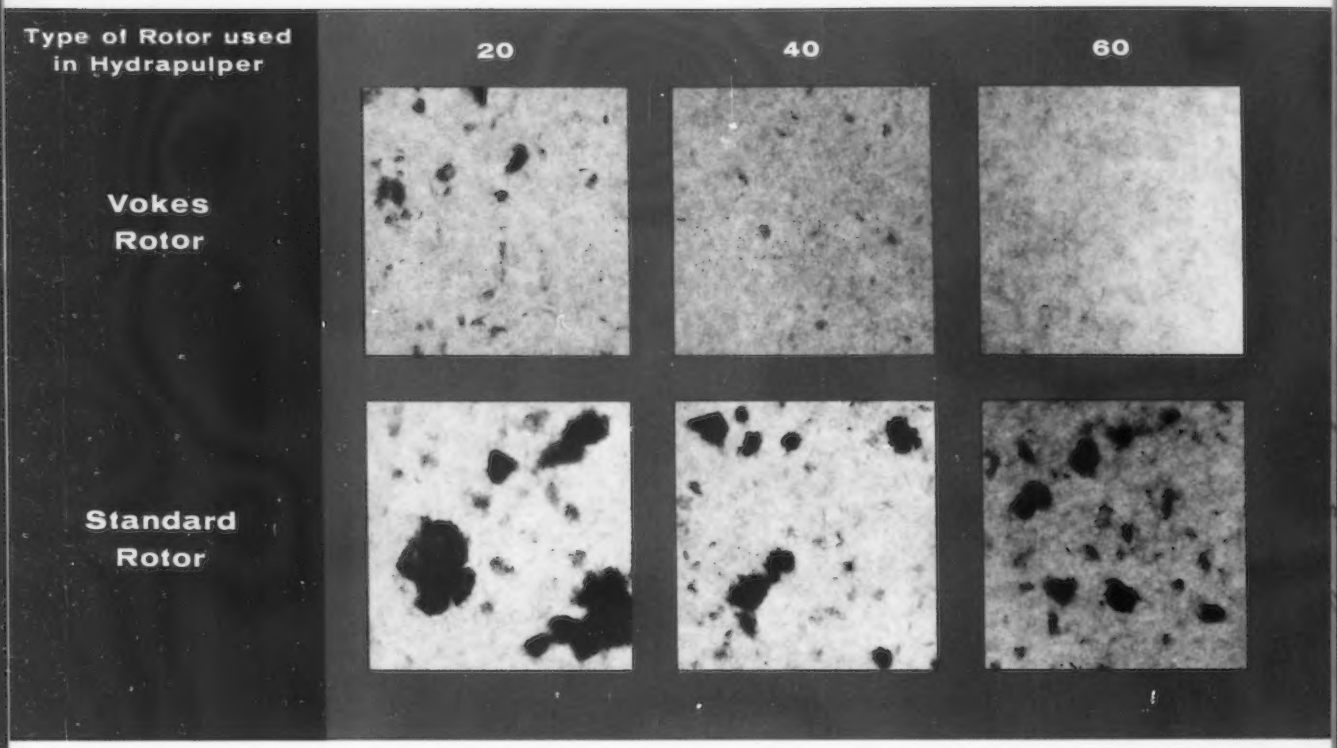

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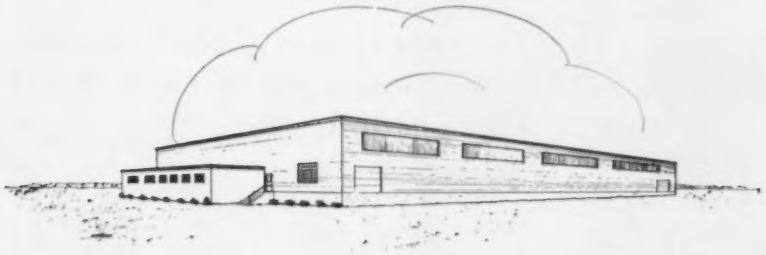
NEWS OF CONVERTERS



Wisconsin Tissue Plans New Plant

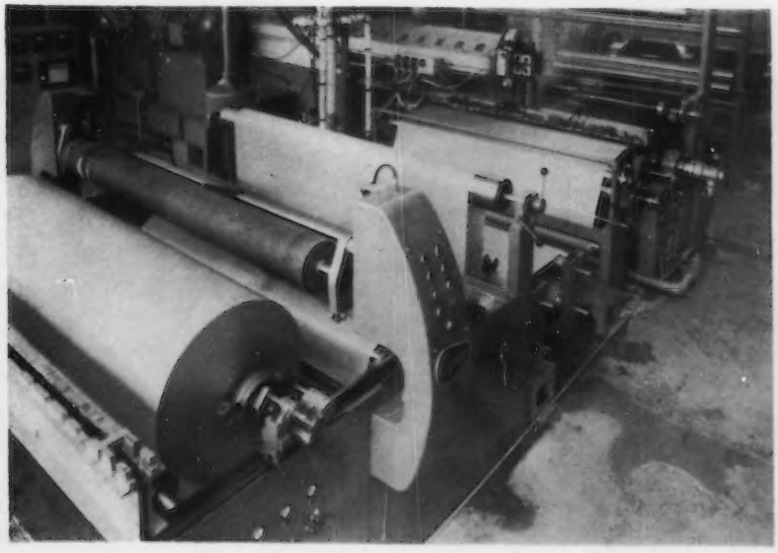
The Wisconsin Tissue Mills at Menasha, Wis., has announced plans for the immediate construction of a new building to house its printed specialty products division. The new plant will provide in excess of 30,000 square feet of additional converting space and is to be constructed on company property located in the town of Menasha.

Present facilities will be used for paper manufacture and converting of unprinted items while the new plant will be used to convert printed specialties. Separation of the two product lines will appreciably increase the warehouse facilities of both divisions and at the same time enable the company to expand its sales effort in printed napkins and place mats.

Egan Extrusion Coating Line Installed at American Sisalkraft

A complete Egan extrusion coating line which will take web widths up to 98 inches has been installed in the American Sisalkraft Corp. plant in Attleboro, Mass., for the production of polyethylene-coated papers, films and foils.

Frank W. Egan & Co. of Somerville, N. J., manufactured the eight-inch extruder and equipped it with a valved adapter with Dynisco pressure transducer and Wheelco pressure indicator. The unit has a length to diameter ratio of 24:1 and a coating die slot opening of 104 inches.



Both the extruder and its direct connected 200-h.p. Louis Allis drive are mounted on a motor driven carriage. An Egan horizontal flying splice unwind, special high-capacity laminator with pre-heat roll, and a continuous operating single drum winder were supplied to handle wide webs at high speed.

Installation of an Egan 12-inch web width laboratory extrusion coater with two-inch extruder also has been completed at Sisalkraft for experimental, control and testing purposes.

Plant Slated For Belgium

Weyerhaeuser Co. of Tacoma, Wash., and Intermills S. A. of Brussels, Belgium, announce the formation of a new European firm—Weyerhaeuser Belgium S.A.—for the manufacture of corrugated shipping containers.

Intermills S.A. is a group of Belgian paper companies operating six mills in Belgium.

The new firm will begin construction in August of a modern container plant at Ghlin, near Mons in Hainaut Province.

Hampden Glazed Names Adams Sales V-P

Robert C. Adams, Sycamore Knolls, South Hadley Center, Mass., has been made a director and vice president of sales of the Hampden Glazed Paper and Card Co.

Continental Can Opens New Jersey Fiber Drum Plant

A new fiber drum manufacturing plant has been opened by Continental Can Co. in Carteret, N. J., where two kinds of fiber drums for dry products will be produced. Peter P. Wojtul, vice president and general manager of the Fibre Drum and Corrugated Box Division, announces.

The 200,000-square-foot plant has been under construction since early 1959 and is the seventh fiber drum installation for Continental Can, which is the nation's principal manufacturer of this product.

Made at Carteret are the Leverpak, with capacities of 12 gallons to 75 gallons and the Stapak, with capacities of 2 gallons to 35 gallons.

Bowater's New Board Mill Marks New Venture in North America

Just started plant features a number of new innovations in pulping and dry sheet forming processes as developed by the Bowaters research department.

The recently completed Bowater Board Co. plant at Catawba, S. C.—the first major hardboard mill in the eastern part of the U.S.—has begun full-scale production of smooth-on-both-sides hardboard. The new installation has been designed to produce 160 million square feet of board a year, using a newly developed air process. Opening of the Bowater Board Co. plant marks the first step towards diversification in North America by the Bowater Organization, one of the world's major producers of wood products. Bowaters has produced both hardboard and insulation board in Europe for European markets for the past 30 years. Initial production of Bowater Board from Catawba will go to the furniture industry. The mill is located near the heart of the nation's major furniture-producing area in the Carolinas.

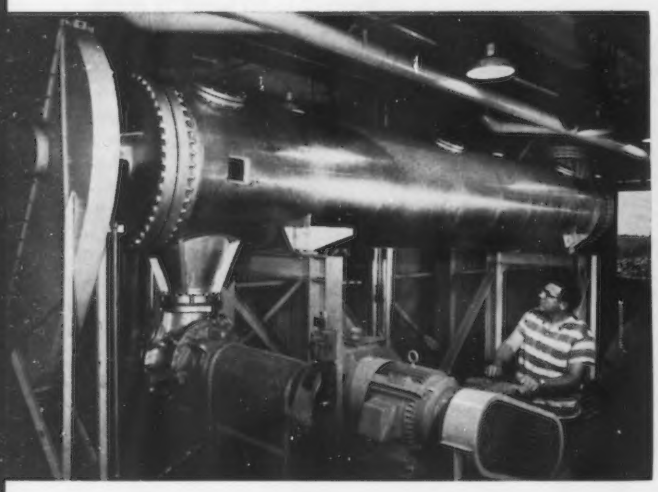
Wood Handling and Chipping

Truck wood is unloaded at the Catawba woodyard by a 50-ton crawler-type crane. As the wood is delivered it can be placed on either of two 80 by 1,000-foot hardwood and softwood storage piles or dropped directly into a flume which leads to the debarking drums. Wood delivered by rail can be unloaded onto the piles by a crawler crane or placed directly into the flume by a self-propelled rake. Water from the nearby Catawba River is circulated through the flume by two 10,000-g.p.m. vertical pumps at the rate of six feet per second. Grit which has been removed from the logs is collected and conveyed from the flume.

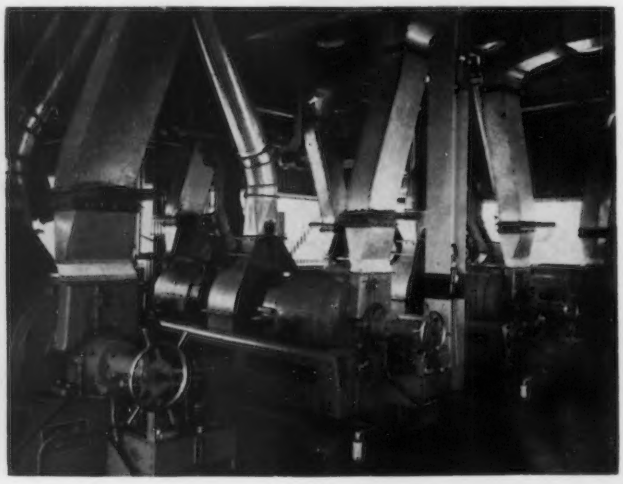
Two suspended-type barking drums, each of which measures 12 feet in diameter and 67½ feet in length, receive the logs from the flume. Three 75-h.p. induction motors drive each drum through fluid couplings and parallel shaft reducers. Bark from the drums is conveyed through a swing-hammer shredder to a 14,000-cubic-foot capacity circular bin and then to the combination boilers for fuel. Logs from the drums pass over a series of conveyors to a 66-inch-wide sorting belt. Accepted logs are fed into two 112-inch, 10-knife chippers (Murco) for the initial chipping of the raw material. Blower housings on the chippers discharge the chips into cyclones from which they travel by belt conveyor to a series of screens. Fines from the screens are conveyed to the drum refuse system and oversize chips from the screens are fed into a 36-inch six-knife rechipper.

A high-pressure pneumatic conveying system carries accepted chips from the screens to either of two 200-cord tile silos (Chemical Linings). Chips are stored here until they are needed for cooking. Rotary plate feeders (Link Belt), each measuring 17 feet in diameter, remove the chips from the storage silos. Operating on a variable hourly capacity, the feeders carry the chips to a bucket elevator which empties into an elevated chip surge bin. Plate magnets located in the chute leading to the surge bin remove tramp iron.

COOKING—Digester where chips are cooked for about five minutes at pressures up to 150 p.s.i.



REFINING—Four disk refiners where various types of resins are added and resulting pulp blown to a dryer.



Cooking

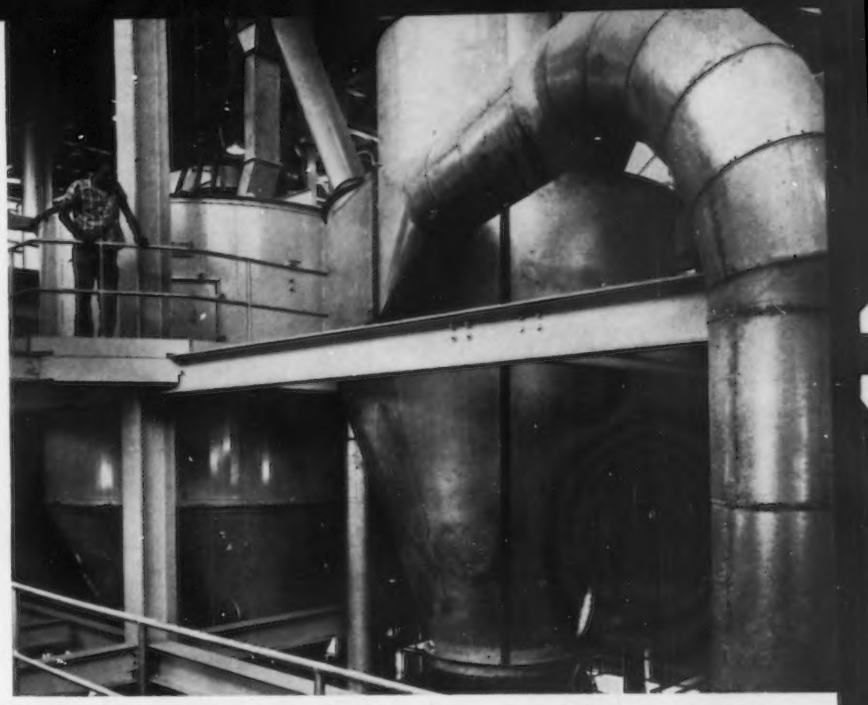
Chips are withdrawn from the surge bin by a screw feeder. The digester is a single horizontal tube of the Asplund type and is fabricated from stainless steel. The screw is equipped with a variable speed drive which permits the setting of a constant flow rate that coincides with the retention time of chips inside the digester. Chips remain in the digester approximately five minutes, regulated by the speed of the paddle-type agitator. Cooking, or more accurately steaming, of the chips is accomplished by working steam pressure inside the cooker up to 150 pounds per square inch.

The chips are discharged from the digester through a rotary valve into a distribution screw (Materials Handling Equipment Co.). Steam discharged with the chips is vented into the atmosphere.

Refining

Four metering screws, one for each of the four Bauer double-disk refiners, draw cooked chips from the distribution screw. Provision is made to recirculate a slight overfeed of chips in the distribution screw back to the chip surge bin. The chips pass over plate magnets before entering the twin-screw feeder of each of the four counter-rotating disk refiners. Each refiner has two 400-h.p. synchronous motors.

The resulting fiber can be mixed with various types of resins as it is being refined. The resins are added into the center of the refiner disk through a hollow motor shaft. A liquid phenolic resin binder is used for standard grade board. Special tempering resins can be added at this same point to develop a through-tempered board with improved physical properties.



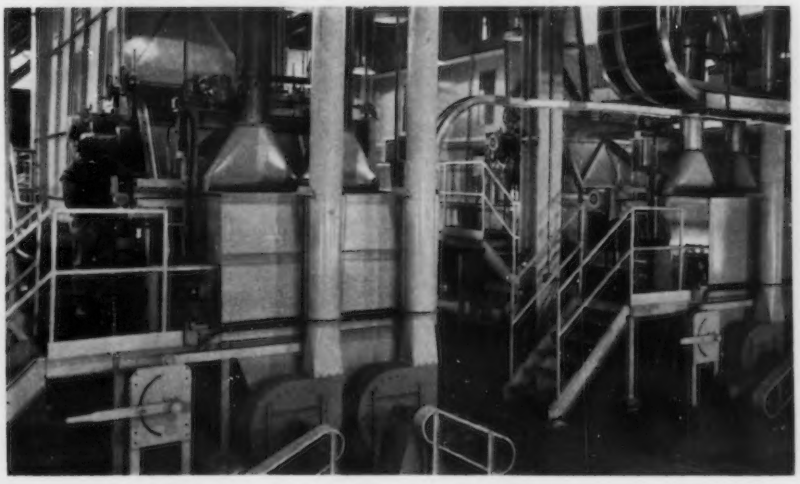
CLASSIFYING—Air separators classify dried fibers and send them to appropriate coarse or fine fiber volumetric feeders.

Drying and Classifying

Heated air swept through the refiner case conveys the fiber into high-temperature flash-drying equipment. The moisture in the wood and the water added with the resin evaporate rapidly while the fiber is being conveyed. Two flash dryers (Edward Renneberg) are in use, equipped with direct-fired (natural gas) air heaters. Each dryer is fed by two refiners and in turn discharges the dried fiber into mechanical air separators for classifying.

The fine fraction from both classifiers is collected in a single combination storage and metering machine called a volumetric feeder. The coarse fraction from each classifier is collected in separate coarse-fiber volumetric feeders. These volumetric feeders are electrically regulated to allow the dispersal of fibers in the proper ratio to produce the exact requirements.

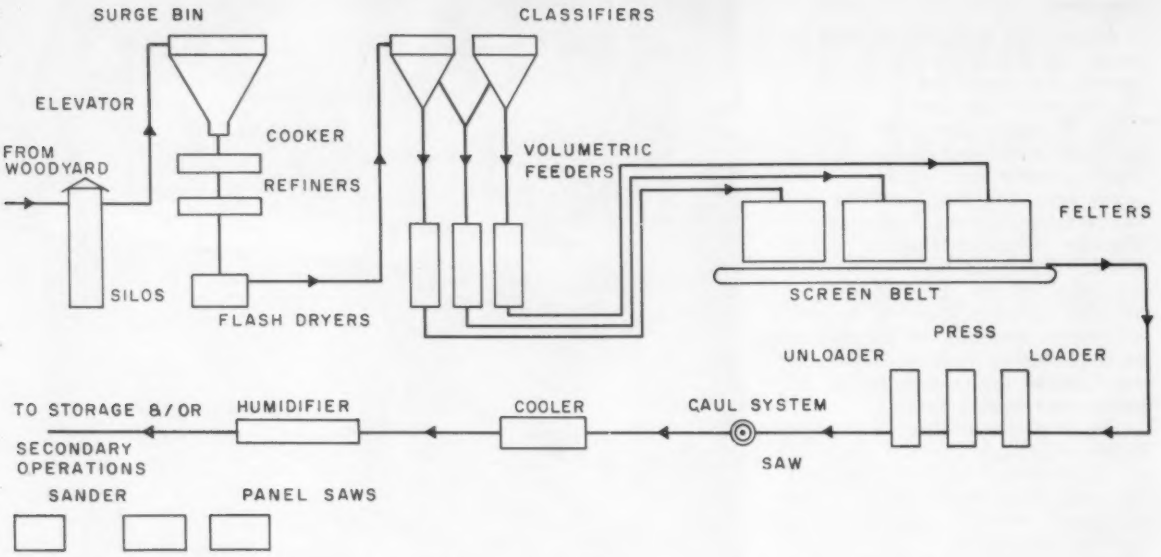
VOLUMETRIC FEEDING—The feeders are combination storage and metering units. There are two for coarse fibers and one for fine fibers.



Dry Forming

Five metered streams of fiber, each pneumatically conveyed through a separate oscillating nozzle, are formed continuously into the desired mat width and thickness. There are two coarse-fiber streams from each coarse-fiber volumetric feeder and a single fine-fiber stream.

These fiber streams are deposited on a moving wire screen that travels over suction boxes located below the nozzles. A continuous multi-layer fiber mat is built up as the screen passes through each section of the felting operation. There are four such forming sections or felting areas. The mat is leveled by three shave-off rolls after it has passed through the first three felters. In the fourth felting area, a layer of fines is added to the mat, allowing the formation of a finished board with superior surface characteristics.



These numerous thin layers of thoroughly-tempered fibers, plus the action of the shave-off rolls during felting, are said to produce a mat with great uniformity and high internal bond strengths.

Pressing

The formed sheet now passes through a precompressing area. Here heavy roll-nip pressures consolidate the mat. Next the consolidated mat is edge-trimmed and sawed into required lengths. These mat lengths are deposited on steel cauls and accumulated in a press charger until a full press load of 20 has been stored.

The charger pushes the new load of cauls and mats into the press as the unloader simultaneously withdraws pressed hardboard and cauls from the opposite side. A total of 475 connected horsepower drives the hydraulic pumps of the press, exerting a pressure of 5,270 tons. Mats are held at pressures up to 1,000 pounds per square inch. Steam pressure up to 850 pounds per square inch inside the steam plates maintains the temperature from one to two minutes.

During this period, the combination of heat and pressure evaporates the moisture, increases the density and polymerizes the phenolic resin binder. Pressed boards are separated from their steel cauls one at a time as both are removed from the press unloader. The cauls are automatically recirculated back to receive another mat and the boards are conveyed through trim saws into the cooler.

An important feature of the Bowater press is its simultaneous-closing mechanism which shuts the openings of the pressure faster and produces uniform boards from the bottom to the top of the press. This simultaneous closing eliminates the tendency of older presses to create a difference in the time-pressure cycle between the top and bottom boards which often affects the specific gravity of the product and causes a wider variance in its physical properties.

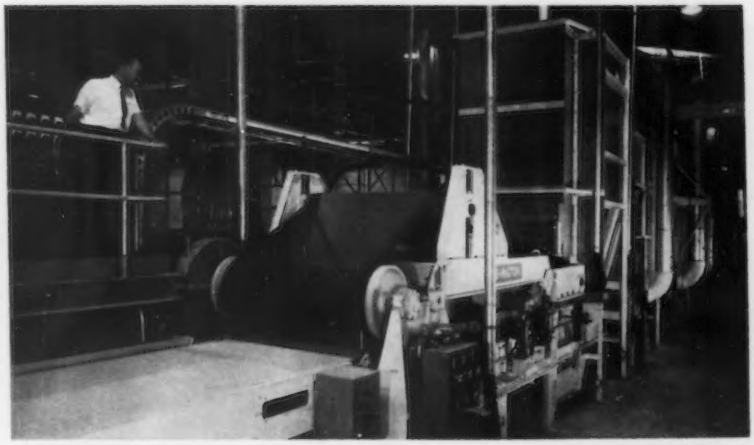
Humidifying, Sawing and Sanding

After cooling, the boards are placed in humidifying vats. The time-temperature cycle (Foxboro) for this humidification process, developed during Bowater's pilot plant program, brings the board to the proper moisture-content level for the particular end use. Boards are stored and subsequently sawed to sizes required as they pass through a panel saw. The product can be ripped and/or cross-cut to individual customer's specifications.

To meet customer caliper requirements, the board, moving at 90 linear feet per minute, is sanded with a three-belt sander. This high-speed sander holds to a caliper tolerance of plus or minus .005 (five-thousandths) inch.

Building Details

The new building covers 100,000 square feet. Its design, incorporates extensive use of concrete construction, and minimizes the area where air-borne waste fiber might collect and reduces fire hazard considerably. The outside walls of the mill building are ten inches thick and consist of two rows of brick with a two-inch cavity between them. The walls are supported by concrete grade beams. The roof of the mill building is in



FORMING—Formers or felters build up a fiber mat which then passes through a precompressing unit. Watching is P. L. Kvale, mill supt.

five bays, three with a 60-foot span and two with a 45-foot span. Roof slabs of double-T, pre-stressed structural concrete, covered with built-up tar and gravel, are supported by pre-stressed concrete beams. Thirty-foot, pre-cast concrete columns, supported by concrete spread footings, support the beams.

The structural steel fiber-preparation area, which contains the cooking and refining installations, has four floor levels and is located directly adjoining the extreme southeast corner of the mill building.

Electrical power for the mill is obtained from the distribution system of the kraft pulp mill of Bowaters Carolina Corp. at the same mill site. Maximum power consumption at the Board Co. plant is 5,000 kilowatts. Utilization voltages are 2,300 volts for motors of 200 h.p. and larger, 440 volts for smaller motors and 120 volts for the lighting distribution system.

All load-center substations (GE) are outdoor type. The 1,000-kva substation's low-voltage switchgear and motor-control equipment are installed in ventilated pressurized control rooms. The hardboard machine is driven by a multiple-generator d.c. adjustable-voltage electrical drive.

John G. Robinson

Joseph R. Hahn

Air Systems

A total of 33 air systems utilizing 6 fan motors are in operation inside the mill to provide necessary process and building ventilation. The manufacturing process uses 90 per cent of the plant's air handling equipment. The fiber used in the formation of the board is conveyed (Day Co.) throughout the system by high-velocity air, moving through ducts which vary in diameter from four inches to three feet. Air-generating fans have motor sizes varying from one to 125 h.p. These air systems convey and dry wood fiber and cool finished hardboard sheets.

A low-pressure air system (Rader), equipped with industrial-type fans, collects board trimming and sawing waste after it has passed through a hog (Jacksonville Blow Pipe) and conveys it to the waste-storage bin located outside the mill.

Five heating-ventilation units (J. O. Ross), located on the north wall of the mill, supply 202,000 c.f.m. of outside air for the inside of the building to compensate for air being exhausted by the manufacturing process.

Product Line and Markets

Bowater Board products will range from low-density to high-density boards. The maximum press size is approximately four feet by 16 feet. Bowater Board will range in caliper from 3/32 to 3/8 of an inch. The low-density boards are designed to fit furniture requirements where hardboard must be of sufficiently low density to permit stapling or nailing and for end uses where die-cutting or punching is required. The higher-density boards with a fine-fiber surface offer superior finishing characteristics to the industrial customer. The boards, produced with high internal bond strength and excellent fiber formation, are ideally suited for use as cores for decorative laminates.

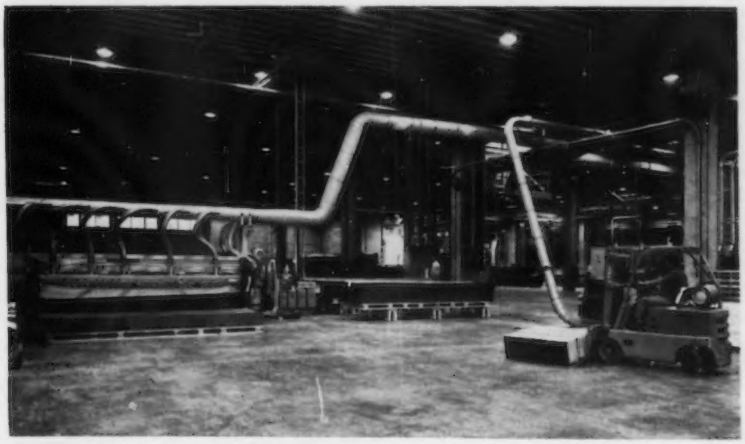
Initial marketing will be to the furniture industry in the Southeast, although the company expects to expand the marketing of its products to other industrial users as soon as practicable. Included are the home-building and light-construction industries, where hardboard is used as lap and panel sidings, interior paneling, wainscoting, underlayment, etc. Expansion into the building-material market is forecast.

Bowater Board Officials

John G. Robinson, mill manager, has been with Bowater since March 1957, serving at the company's pilot plant project in Oregon prior to being named mill manager. Previously he was associated with the Weyerhaeuser Co. as a project engineer, then as superintendent of that firm's hardboard mill in Klamath Falls, Ore. He is an engineering graduate of the University of Minnesota.

Joseph R. Hahn, sales manager, before joining Bowater Board in May 1959, was associated with the sales staff of the Masonite Corp. for 12 years. He also formerly held position is the sales department of Armstrong Cork Co. He is an engineering graduate of Purdue University, LaFayette, Ind.

Palmer L. Kvale, mill superintendent of Bowater Board is a native of Minnesota and a graduate of the University of Minnesota, he was with a mill in Oregon before joining Bowater in February 1960.



PANEL SAWING—The panel saw is the final stage in production. Here workmen (left) are loading the finished board as it emerges from the saw.

Some Definite Improvements In

A Mill's Finishing Operations

This report from one of our largest fine paper mills, S. D. Warren Co., Cumberland Mills, Maine, details developments which have improved finishing efficiency there.

A. R. Perrin, Jr.,
S. D. Warren Co.,
Cumberland Mills, Me.

In a recent PAPER TRADE JOURNAL article the following summary statement was made:

> "We do have difference, true, but not so basically that every mill must resort to special designs and ways of doing things that require a custom treatment throughout and are found nowhere else except that mill."

This thought was in my mind when I was asked to express some "thoughts on finishing." We are by no means extraordinary finishers at S. D. Warren, and I'm sure some of what I have to say is not new.

We have had both failures and successes in our attempts to improve finishing efficiency. I would like to discuss both here.

Keep in mind that I am speaking of a mill making a complete line of plain, machine-coated, and coated papers along with a sizeable smattering of specialty items. We finish about 87 per cent sheets— 13 per cent rolls. Of the sheet tonnage 70 per cent is on skids, 25 per cent in cartons and 5 per cent in wooden cases.

Roll Certification

The largest factor involved in the reduction of paper finishing costs is that of quality. The quality of the paper coming to your finishing department affects sheeting and inspection costs, waste, and to a lesser extent trimming and packing costs.

Fortunately we are blessed with a group of fine papermakers in our production department. To take advantage of his high level of quality, we have set up a program called "Roll Certification." By this we mean that each machine operator—whether paper machine, super-calender, coater, embosser, rotary cutter etc.—passes judgment on each roll which he processes. This judgment or certification is recorded on the roll identification ticket and is used to inform the next operator as to the quality of that particular roll.

Such information is invaluable in the sheet finishing area. Good rolls may be cut together and given a brief inspection. Bad rolls, possibly cut together, are given a more thorough inspection. Each of these inspections is based on the economics of the paper quality and end use involved. But the main lesson to be learned here is that inspection costs may be reduced. The one bad roll in five, properly identified, will be left out of that particular roll set, and cut singly or with other similarly defective rolls.

Obviously, this is a long range program. All operating personnel must be trained to a reasonable understanding of the various end use qualities. Where substantial costs in fanning and/or sorting inspection personnel, space, and equipment are involved, perseverence in a certification program will pay dividends. Sometimes I become irritated with the temporary setbacks our program endures. But more than once it has been suggested that if I'm such a good papermaker I should be over there in the paper manufacturing department. I'm not such a papermaker. They know it and I know it. So we continue to progress towards a better system of quality communication.

Paper Quality Vital

In our operations where production depends on the ability to group cut a substantial number of orders, and to keep our inspection stations producing at a reasonable rate, paper quality is an important key to production. If this production experiences a significant drop, surge areas quickly fill up, costs go up in the areas affected, waste increases, and very shortly costs increase in areas dependent on the production of these inspection stations. In other words, poor paper quality can quickly make finishing a very inefficient operation no matter how good basic efficiency of your particular finishing systems.

Inspection Improvement

One of our more successful ventures has been the use of hydraulic lift tables at our count and fan stations. The old method of fanning inspection has many good applications for grades where a few random defects and some non-random or stratified defects are common. We use two lift tables—one for the working load, and one for the finished load.

The female inspector accomplishes the necessary amount of fanning on a quantity of paper on the working load. She then slides this paper onto the finished load in small lifts—the size of the lift depending on the sheet characteristics and the physical capabilities of the inspector. These lifts vary from 20 to 50 sheets. We have, then, in addition to our fanning inspection, an inspection of a full sheet every 20 to 50 sheets. Should the paper become defective to the point where fanning inspection is no longer safe, then it is a simple matter to single or two sheet sort until the particular defective area has run out.

Here is an example of an application of standard equipment which

A paper presented at the 1960 Spring Meeting of the Maine-N.H. Section of TAPPI.

produces an excellent result for us. The main advantages are these:

1. The inspection of each load is completed in the one operation.

2. Piling is accomplished by the female inspectors.

3. Quality and efficiency of inspection are improved.

New Trimming System

In recent years there have been many systems developed to improve the efficiency of mill trimming operations. Southworth, Rice-Barton, American, and others have come up with satisfactory methods. However, each of these has certain limitations which were important enough to cause us to look for even better systems. We have developed a method which we feel has the necessary efficiency and flexibility for our production.

The method consists of the following:

1. A hydraulic levelator which maintains the untrimmed load at the proper height for either pulling directly onto or turning over onto the loading table.

2. An overhead paddle-pusher which drives three to six press-loads of paper down the 280 inch loading table. This pusher is activated by a limit switch triggered by the trimmer press tailboard.

3. The piler or unloading table is a simple short-mast stacker set on tracks in the floor and driven by a rubber wheel. The forks of this stacker carry a reenforced air flotation table top with an eight inch lip on the unloading end.

With this equipment loads are pushed onto the side of the press with the tailboard all the way back. The trimmed load is then pushed onto the piler by the untrimmed load via the tailboard. The other piler is run over the skid and dropped 8 to 10 inches short of the skid platform end, the paper lift pushed off the air table, positioned on the skid, and the piler table is then raised slightly and driven out from under the pressload of paper. The piler returns and positions itself in a pre-load area ready to receive the next lift from the press.

Limit switches are used to control the table from pre-loading positions to pre-piling position. Another switch shuts off the table air when the piler is in motion.

Three men are used in this operation. All three are trimmer operators and rotate each hour from the trimming position to the loading-unloading positions. Our production on this press has increased 26.5 per cent per man-hour and 27 per cent over-all. I should point out, however, that we feed our largest paper into this press and never trim more than a two-out-of-one sheet. We will shortly equip another press in this fashion and then, with keener competition for the large sheets, the production figures quoted above will be reduced a bit. But, we feel that the efficiency and flexibility of this system are superior to anything we have seen thus far.

Taken at the Maine-NH TAPPI Spring Meeting

D. Hall (center) of Eastern Fine Paper & Pulp Division of Standard Packaging Corp., chairman of the industrial engineering and material handling session, with M. C. White (left), Oxford Paper Co. and A. R. Perrin, Jr. (right), S. D. Warren Co., who presented papers at this session. Mr. Perrin is the author of the paper presented on these pages.

Under the heading of packaging I would like to discuss two items—one, skid packing and two, carton packing. We have had our failures in both of these areas. I will outline both the failures and what we hope to be successes in these packages.

Skid Packaging

Several years ago a great deal of effort went into the development and field trials of a skid wrapped only in corrugated board—no straps, no wooden cover. This was accomplished by using precut corrugated panels and cap or top piece which were placed around the skid and held by latex adhesive. This skid and corrugated cover or "kimona" as it was called, was then placed under a hydraulic pressure station. While under pressure the corrugated panels were nailed to the skid deck. This produced a skid with excellent protective wrapping, but unfortunately insufficient tension to hold the paper in place. Several methods of securing the corrugated board to the skid deck were tried unsuccessfully. This proved to be the major problem in the development of this package. Other minor difficulties were the opening of the skid and disposal of materials.

We learned something from these trials, however. It was this: That we do not like to funnel all our skids through one fixed station. The idea of a pressure packing station has been dropped. Our new system, now being built, is multiple tool strapping. Our tests indicate that in strapping a skid with one tool the first two to four straps are used to remove the air from the paper and to adjust the package—the last two to four straps actually tension the load. If an individual strapping tool is used for each strap—and these tools tensioned simultaneously, a more even distribution of tension obtains. Since all straps are actually used to tension the skid, fewer straps are required. The average number of straps per skid is now approximately seven—we plan to reduce this average to five, possibly four. We feel that this move is justified because only that number of straps useful in applying tension to the skid under the normal method of tensioning straps individually.

Advantages Obtained

The advantages of the multiple tool strapping method seem to be these:

1. A better package
2. Reduction in wire usage
3. Reduction in labor

The second item under packaging is the vacuum carton sealer developed by Southworth Machine Co. for telescope cartons. We have had a certain amount of experience with pressure seal packages. Our efforts met with failure because the carton package was difficult.

Paper Trade Journal Staff Report

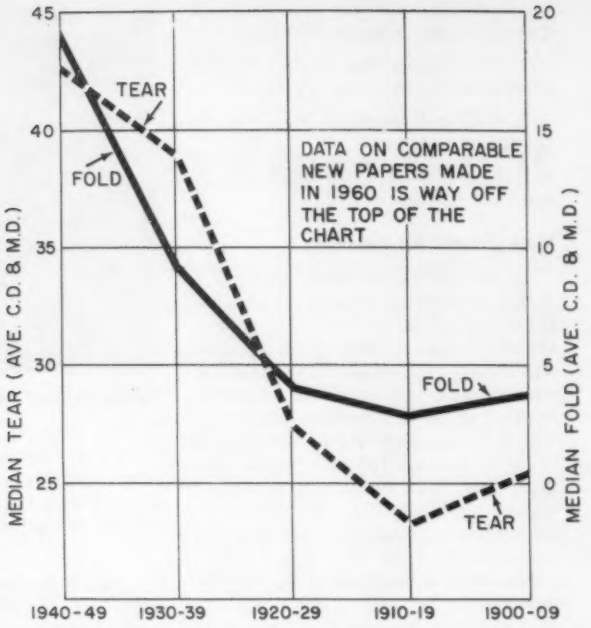


Figure 1. Comparison of present strength of book papers made during the past 50 years.

Rapid deterioration of library books made from paper produced in the last 50 years is causing concern. Reported here are work on methods to measure durability of non-coated book papers and commercial development and runs of furnishes which give much greater life expectancy.

How to Make Book Papers With Longer Life

A recent study of the life expectancy of the paper commonly used in the printing of non-fiction books in this country indicates that the life expectancy of 90 per cent of the papers tested is under 50 years. This inadequate life expectancy for this kind of books is typical of the paper used in most of them since the turn of the century (See Figure 1), reports W. J. Barrow of the Virginia State Library in his seventy page book "Deterioration of Book Stock, Causes and Remedies."

It was obvious that the principal difference between book papers made earlier than this century and since is that chemical wood pulp is now the principal source of fiber rather than rags.

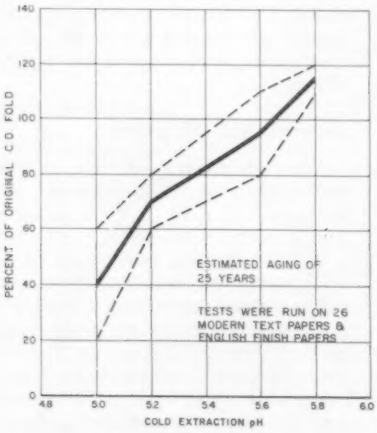


Figure 2. Effect of sheet pH on strength loss on aging.

Tests Used

The author in his studies used the folding and tear tests as measurement of physical deterioration of the papers since these measure the principal stresses set up when a page of a book is turned. He used the artificial aging method developed by the National Bureau of Standards, which consists of heating papers in a laboratory oven with the temperature kept at 100°C. ± 2°.

Acidity Chief Factor

As has long been suspected the chief factor in the rapid aging of modern book papers is acidity. This was confirmed by checking the pH of papers with varying longevity (See Figure 2) as well as by treating papers with a short life and low pH with a calcium carbonate solution

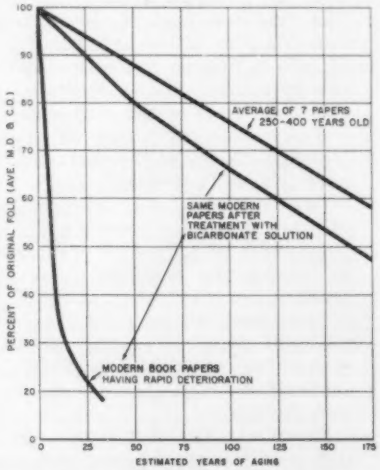


Figure 3. Comparison of strength loss on aging for modern and old papers.

and then checking their ageing properties (See Figure 3).

Another factor in degradation of cellulose fibers in paper is oxidation. Principal factors are the pH of the paper and the type of bleaching stages used on the pulp. Chlorine and hypochlorite stages are said to leave reactive groups on the cellulose chains. Pulp bleached in chlorine dioxide or peroxide stages is less susceptible to this degradation.

The presence of certain metallic ions also promotes oxidation, particularly harmful are manganese, copper and cobalt. Copper sulphate should not be used as a slimicide in paper mills manufacturing a paper where permanence is important.

TENTATIVE SPECIFICATIONS FOR DURABLE, NON-COATED, CHEMICAL PULP BOOK PAPERS

Based on 25 inch x 38 inch size at 60 lbs. per ream.

1. The paper must be free of groundwood and unbleached fibers.
2. On the basis of a minimum of 15 test strips, from 15 different sheets selected at random from a ream, initial folding endurance of conditioned strips shall average not less than 300 folds in the weakest direction as measured on the M.I.T. tester at ½ kilogram tension.
3. On the basis of a minimum of 12 test strips (selected as in 2) and tested by 5 tears through 4 strips initial tear resistance of conditioned strips shall average not less than 60 grams in weakest direction as measured on the Elmendorf tester.
4. After artificial aging at 100°C±2° the average of strips (selected and tested as in 2 and 3) shall not show less than the following fold and tear for the days of aging indicated:

Days	Fold	Tear
12	200	53 grams
24	140	48 grams
36	100	43 grams

5. The pH of the paper shall not be less than 6.5 at time of manufacture, and after heat aging (as in 4) for 3 days shall show no sharp decline.
6. Opacity of the paper shall not be less than 90.
7. Procedures for testing shall follow TAPPI standards unless otherwise indicated.

Latest Developments

Mr. Barrow continued his work following publication of the book mentioned above. He first set up specifications for more durable non-coated book papers which included chiefly standards for folding endurance and tear on new and artificially aged papers and for acidity (pH). No existing commercial papers were found to meet these specification in entirety. To meet these specifications it seems essential that the papers contain a high percentage of long fibers that are resistant to oxidation, and that it be possible to size and manufacture the paper under alkaline conditions. It also appears desirable that an alkaline filler such as calcium carbonate be used in its manufacture so that the paper will contain a built-in acid buffer.

The next step was the development of papers which would meet these specifications. Two such commercial papers were developed in this project for manufacture in a medium price range. It is estimated that the life expectancy of the new papers will be more than four hundred years, as compared with fifty years now.

Experimental Runs

A number of experimental furnishes were developed, using bleached kraft sulphite and soda pulps plus calcium carbonate fillers. The only size which was found to be suitable to the specifications was Aquapel (a product of Hercules Powder Co.) which does not, like rosen size, require alum to set it on the fibers. These furnishes were then run on the 24 inch paper machine at the Herty Foundation in Savannah, Ga. The resulting experimental papers far exceeded most commercial papers in strength and life expectancy. It was therefore decided that a trial should be made in a commercial paper mill.

Paper Mill Trial

Through the co-operation of the Standard Paper Mfg. Co. of Richmond, Va. and its chief chemist, A. L. Rothschild, two trial runs were made on a commercial paper machine. Selection of the fiber furnish was left to the company and equal parts of bleached kraft, sulphite and soda pulps made up the fiber furnish of the first run. Ten per cent clay, and ten per cent calcium carbonate were used as filler. The paper was internally sized with Aquapel and surface sized with a seven per cent starch solution. Furnish of the second commercial run was not revealed. The two papers met or exceeded the previously set-up specifications in every way.

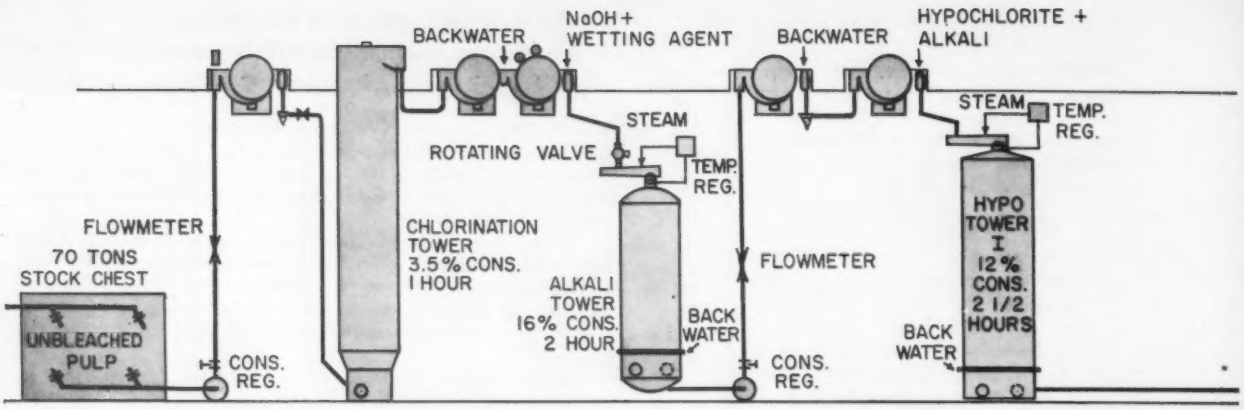
The papers were then used by a number of commercial printers without any difficulties with their utilization.

Detailed Report Available

A detailed report by Mr. Barrow, entitled "The Manufacture and Testing of Durable Book Papers" will be published by the Virginia State Library this summer. The report contains complete details of the development of both the specifications and the commercial papers outlined here. Mr. Barrow became involved in papermaking because as a document restorer he was concerned with the rapid deterioration of books produced in this century. This work was carried on under a grant from the Council on Library Resources, Inc., a subsidiary of the Ford Foundation.

WHAT IS AQUAPEL?

Since the most important item in the furnish of the durable book papers is the alkaline sizing agent, Aquapel, we present some data on it. Aquapel is an alkylketene dimer prepared from long-chain fatty acids. There are a number of grades of Aquapel, depending on the fatty acid used. The effectiveness of Aquapel as a sizing agent depends upon the fact that it spread out over the fibers as a monomolecular film and reacts with some of the surface hydroxyl groups of the cellulose molecule. Aquapel may be used as an internal size or applied at the calender stack or size press. It may also be used in coatings as both a release agent and sizing. Aquapel reacts with the fiber without the addition of alum, in fact alum should not be used, as Aquapel is most effective near or above pH 6. Other advantages, than paper durability, claimed for Aquapel over rosin size are: improved sizing; higher sheet strength and brightness; and reduced wire and fourdrinier corrosion due to running at a higher pH.



Swedish Mill Bleaches Sulphite Pulp With Chlorine Dioxide

Both spruce and birch pulps are bleached in this very modern six-stage plant of Marma-Langrors AB mill at Vallvik. Featuring elaborate instrumentation, only one operator is required for the entire process.

Per Svanberg,
Manager, Sulfitfabriken,
Marma-Langrors AB,
Vallvik, Sweden

LJ pulps produced by Marma-Langrors AB's Vallvik mill are characterized by the high brightness, cleanliness, and strength attained through the chlorine dioxide bleaching. This is mainly due to what is probably one of the world's most modern sulphite bleaching plants which features fully automatic control of chemical dosage, pH, temperature and other processing factors.

The symbol shown above, used to denote Marma-Langrors' various grades of pulp, is derived from the Ljusnan river in central Sweden, along which the pulpwood is floated to the mills. The wood is collected in Lake Marma, down the lower reaches of the river, where the Marma kraft mills are situated. To generate electric power, the company has utilized a waterfall about 25 miles up the river at Lottefors. A groundwood mill of the same name is also situated there.

Vallvik, the sulphite mill, is located farther out on the east coast and was built in the years 1907-1909. It has been expanded and modernized continuously since then, so that today it produces annually 50,000 tons of spruce and birch bleached and unbleached sulphite pulps. The head office of the company is in the city of Soderhamn.

Put into operation in 1957, the new bleach plant at Vallvik is of Kamyr design and was designed to produce 200 tons of bleached pulp per 24 hours. Its six stages consist of, in sequence: chlorination, caustic extraction, three hpyochlorite treatments, and a final chlorine dioxide treatment.

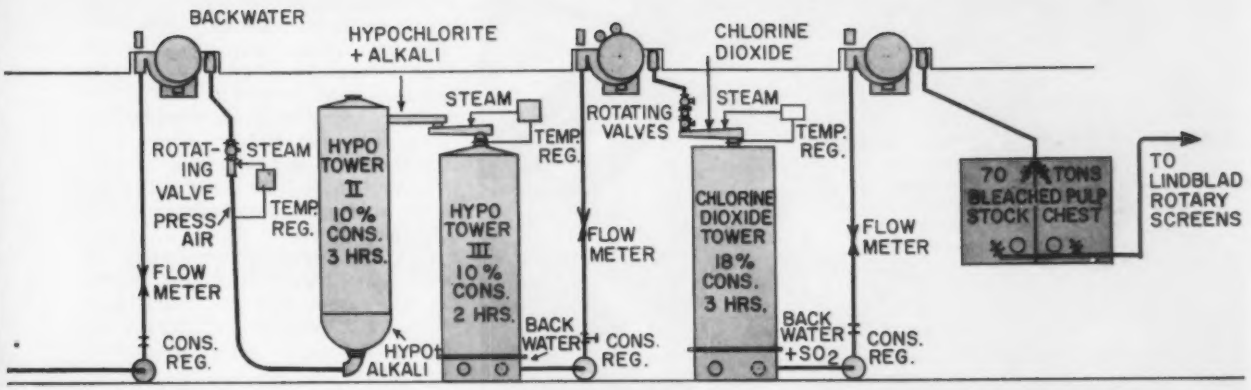
After each stage the pulp is washed and thickened on one or two drum filters, as depicted on the above flow chart of the bleach plant. These eight washers are Kamyr's model 54, with drum diameters of 10 ft. 10 inches, and width of 11 ft. 10 inches. The wash water used is filtered river water.

Summary of Process

To provide surge capacity and in order to equalize variations in the chlorine number of the various cooks, two stock chests are installed for the unbleached pulp. These have total capacity of 16,480 cubic feet, or 70 tons of pulp at five per cent consistency. For the bleached pulp there are two stock chests of the same dimensions following the chlorine dioxide stage.

Chlorination of the unbleached pulp occurs at the bottom of the upflow first stage tower. Chlorine gas is mixed with pulp slurry by an agitator; the chlorinated pulp at 3½ per cent consistency, is retained in the tower for one hour. It is then diluted with water to 1½ per cent consistency at the top of the tower and scraped off tangentially by a rotating arm.

After twice being washed and dewatered, the pulp is mixed with caustic solution on the off-side of the



second washer. The slurry drops through a rotating valve, is mixed with steam and then falls into the downflow second stage tower. This tower is also designed for operation under pressure. The slurry at 16 per cent consistency is retained for two hours before it is diluted at the base of the tower and then again washed twice.

Hypochlorite solution is added to the dewatered pulp off the second washer. Again, the solution is mixed with steam as it drops into the first of three hypo towers. Dividing the hypochlorite process into three stages permits treatment to be performed under extremely mild conditions. Conditions of consistency, retention time, and point of application of hypochlorite solution are noted on the flow chart. Pulp is scraped from the top of upflow hypo II tower by a rotating arm into a central screw. The screw transports the pulp to the steam mixer at the top of the downflow hypo III tower.

Final brightness is brought up to 91-92 GE in the last stage. Previously thickened, the stock passes through two rotating valves into a mixer where chlorine dioxide solution and steam, if needed, are added. The slurry is retained in downflow tower for three hours at 18 per cent consistency.

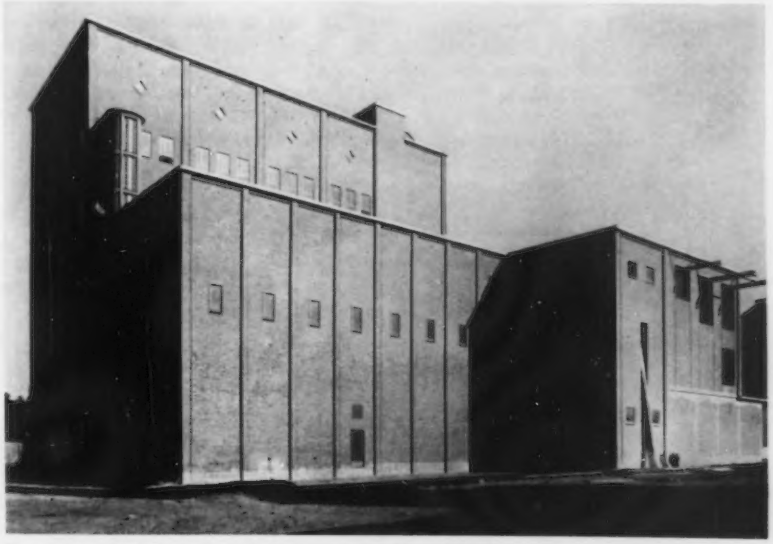
As the bleached pulp leaves the bottom, it is diluted with white water. At the same time, sulphur dioxide antichlor is added. After subsequent washing and storage, the pulp is then screened in rotating vibratory screens (Lindblad) and 3-inch Hydrocyclones (centrifugal cleaners) before going on to the wet machine and the dryers.

The chlorination and the chlorine dioxide towers are made of concrete with acid-proof brick lining, while the caustic tower is steel lined with stainless steel. The hypochlorite towers are of rubber-lined steel construction.

Preoxidation

The bleach plant has been so designed to allow the production of both dissolving grade pulps, as well as bleached sulphite paper pulps. In order to avoid the problem of resin (i.e., fatty extractives) when bleaching birch sulphite, it is possible to couple the stages so that the process begins with a hypochlorite treatment preceding the chlorination tower. It has been found that a pre-oxidation of the birch resin by hypochlorite (or chlorine dioxide) before chlorination makes the saponification and dissolving of the resin in the caustic-treatment more effective and prevents depositions of calcium soaps on the filters, etc. in the latter hypochlorite and chlorine dioxide stages.

The requirements for fresh steam for the bleaching has been reduced through the installation of a very extensive heat recovery system. By using only white water to dilute the pulp in front of the washers, it is possible to keep the water from the bleach plant at a temperature which allows it to be used to heat the incoming fresh water through De Laval heat exchangers. The warm water from the various washers is collected in two separate systems, one for higher and one for lower temperature. Thus, there is water of three different temperatures available for the washing, i.e. cold water, low temperature warm water and high temperature warm water. Operating experience has shown, however, that due to the resin problem it is not possible to go too far in trying to reduce water and heat consumption in a sulphite bleach plant.



Structure which houses Vallvik's new six-stage bleach plant.

Stop-start control consoles and three of the washers.

Chemical Makeup

Hypochlorite solution is prepared in a Kamyr batch system. First lime is slaked in a Dorr-Oliver slaker and pumped to a milk-of-lime storage. From tank, two chlorination-settling tanks are charged. Liquid chlorine is set to the milk-of-lime. The chlorination is stopped at pH of 11.4. After settling the clear hypochlorite solution is siphoned to hypochlorite storage tanks by a swivel siphon pipe. The residue sludge from two or three batches is accumulated in a wash tower, washed with fresh water and allowed to settle. The supernatant wash water, which contains hypochlorite and unreacted calcium hydroxide, is used to dilute the milk-of-lime in the chlorination settling tanks. The washed sludge is dumped.

Chlorine dioxide is generated according to the Holst method. Sodium chlorate solution, acidified by concentrated sulphuric acid, flow into one of the reactors while the other is operating. Sulphur dioxide, sparged in at the bottom, reduces the chlorate solution. Chlorine dioxide thus produced flows from the top of the reactor and is dissolved in water. The chlorine dioxide solution is then stored until used. A separate flow sheet shows the Holst method as employed at Vallvik.

Sulphur dioxide requirements are supplied from a pyrites roaster. The sulphur burner shown in Figure 4 is used as a reserve for the roaster.

Liquid chlorine, sodium hydroxide (60 per cent) and concentrated sulphuric acid are shipped to the mill in railway tank cars. Burnt lime is transported by railway cars. Sodium chlorate arrives in 2500 Kg. containers.

Elaborate Instrumentation

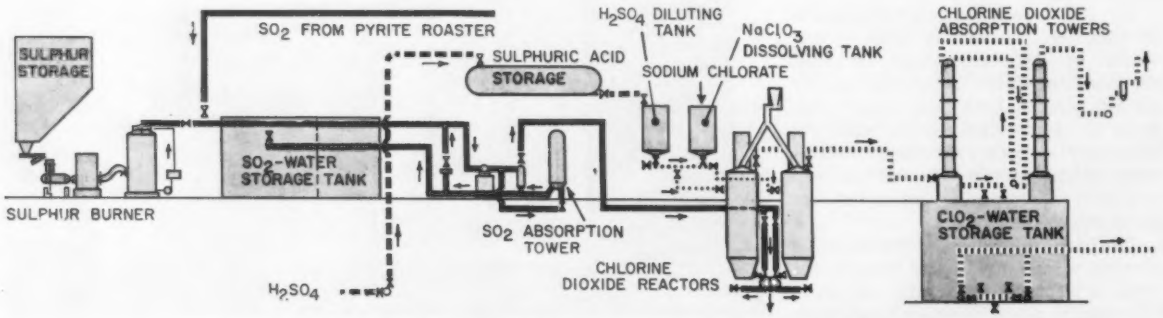
To obtain the highest possible uniformity of operating conditions and also in order to reduce the need for manpower, the bleach plant is elaborately instrumented and the general operation is automatic to a very high degree. The pneumatic type instruments for both the bleach plant and the liquor preparation which have been supplied mainly by Siemens have been combined in one central room built in conjunction with the washer floor. From here the operation is supervised. The instruments have been incorporated into a schematic flow panel of the bleaching process.

The equipment is usually started and stopped from consoles located on the washer floor and from these it is also possible to operate all valves for pulp, water, chemicals, etc., by pneumatic actuators. All that is required to operate the entire bleach plant is one man per shift.

From the control room, the flow of pulp and chemicals to the various bleaching stages is measured and controlled. Flow of pulp to each stage is measured through Venturi tubes after first having been brought to a uniform consistency by a Kalle controller. Flow of chemicals is ratio-controlled to the flow of pulp. Orifice plates and the Venturi tubes are used as a primary device for measuring the flow of chemicals. The controllers are equipped with manual automatic switches making it possible to hand-operate the values for pulp, steam, and chemicals during operation.

Steam to the mixers is measured by temperature controllers; with their impulsers placed at the mixer outlet. Temperatures in the bleaching towers, white water lines, bleach liquor preparation equipment, etc. are registered on two 12-point strip chart recorders. For the chlorine dioxide preparation, there is acoustic and visual warnings that signal excessive temperatures.

The daily maintenance and control of the instruments is taken care of by one man working half time. Apart from this it seems sufficient to have a general check once a year during the vacation shutdown.



FLOW SHEET OF HOLST METHOD OF GENERATING CHLORINE DIOXIDE AT VALLVIK.

MAINTENANCE SERIES
NUMBER 22

Chimney Design and Upkeep — How and Why Of It

Some of the factors that affect chimney maintenance are: design, materials of construction, linings, high temperature, corrosive fumes, uniform operation, repair of cracks, lightning, who does the inspection and repair.

E. H. MacDermott,
Project Manager,
Chimney Dept.,
Rust Engineering Co.

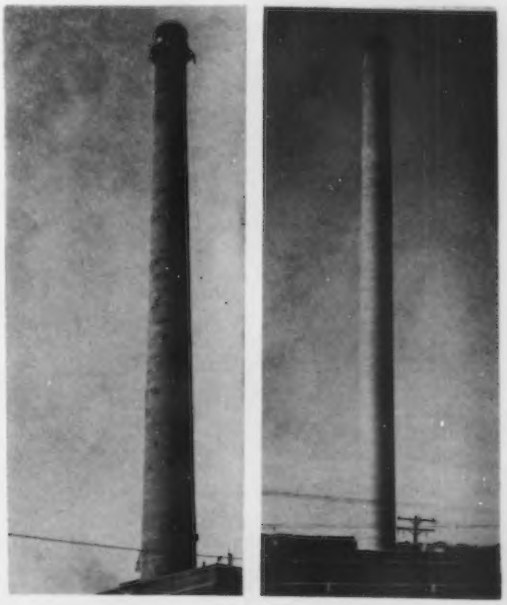
The amount of maintenance needed to keep pulp and paper mill chimneys operating efficiently depends in large part on their proper design. The question of correct chimney design is one that is debated from year to year by engineers, owners and builders, resulting in structures of varying designs for specific production requirements.

The problem of maintenance of paper mill chimneys should be foremost in the mind of the original designer. As far as providing sufficient draft is concerned, standard calculations determine the height and area of the structure to provide the proper flow of gases through the equipment. The important specification task, then, is to select construction materials which will best resist the effects of temperature and fumes.

Brick, Concrete, or Steel

Generally speaking, chimneys are built of one of three combinations of materials: concrete outer shafts with or without inner linings; brick shafts with or without linings; and steel shafts with or without linings. Steel chimneys are usually referred to in the trade as stacks to distinguish them from those of concrete or brick. Linings are built of brick or gunite but the make-up depends largely on the service they must give. Some engineers favor linings on shelf angles or corbels; others prefer linings built independent of the outer shell, but here again the design is usually governed by the service requirements. The maintenance problems may vary according to many factors, some built in, and others resulting from outside, natural forces.

Because it can be more readily protected by surface treatment than brick masonry, the outer shaft is usually made of reinforced concrete. The most acceptable lining is a separate unit built of solid, dense, acid-resistant brick, laid in acid-resistant



A spalled 220-foot chimney was no longer an eyesore when the surface was reconditioned.

This 244-foot brick chimney is being reinforced by a series of steel bands and a concrete casing. It was extended to 275 feet in height after first having the foundation strengthened.

mortars of a silica or resin base. The lining is in sections varying in height and thickness according to the size of the structure. Steel bands around the lining provide lateral strength. Both lining and outer shaft are protected at the top with cast iron or stainless steel caps. Care should be taken to provide a ventilated air space between shaft and lining. This space not only serves to prevent fumes, condensates, and heat from reaching the outer shaft, but also keeps the shaft from striking the lining when it weaves in a high wind. A minimum clearance of six to eight inches is recommended between the outer shaft and the lining.

The concrete wall is protected on the inside and for about 25 to 50 feet on the outside with acid-resistant asphaltic or resinous coatings to ward off the corrosive effects of condensates always present in fumes from recovery units and often from boiler units where bark and other wastes may be burned.

Causes of Deterioration

The causes of deterioration cannot be listed according to their importance since disintegration is frequently the result of a combination of circumstances. Corrective measures, therefore, include not only structural repair but modifications in operating procedures. However, the major problems seem to be caused by corrosive fumes and moisture produced by the manufacturing process served by the chimney.

Corrosive fumes are of a great variety. In paper mill recovery processes, they are sometimes acidic and occasionally alkaline; they are almost always moist and, if low temperatures prevail, heavy condensation takes place which becomes very troublesome.

The most frequent damage caused by moist fumes is damage to the concrete. The concrete is usually given protection of some kind but frequently errors in design or poor workmanship in the field creates a situation where the coatings and other protective features do not function properly. There are conditions against which even the best available products are not entirely adequate. Where a brick lining is supported on shelf angles or corbels with an air space of two inches or less, moisture often seeps through the lining and finds its way out through construction joints in the concrete or brick shaft. With the use of fans and vent nozzles at the top to dissipate the gases, positive pressure is present inside the chimney instead of negative pressure which prevail under conditions of natural draft. This positive pressure forces the gas and moisture through the lining and out any small fissure present in the outside wall, exposing the concrete and steel reinforcement to attacks. Attacks on the outer wall also take place in the upper part of the chimney where the condensates are deposited and washed down over the outside.

High Temperatures

The problem of high temperatures is easier to combat by using high heat duty refractories in the lining. However, many owners, thinking it to be more economical, will use inferior materials in original construction, which results in higher upkeep and offsets any savings made in the beginning. Short linings can result in the cracking of the outer structure. Where temperatures are concerned, much damage may result from intermittent operation; for example, many incinerators are operated on a five-or six-day-a-week basis being shut down over Sunday. The plant is started up on Monday with the heat rising to operating temperature of a thousand degrees or so in a couple of hours. The thermal shock resulting from this practice is so severe that the linings need frequent attention.

Another cause of break down in chimney structures is lack of uniformity in operation. Some factories operate on a seasonal basis with their equipment standing idle in the off-season; such operations are very detrimental to chimneys. The best service is obtained from uniform operation throughout the year.

Lightning damage to brick chimneys is usually very severe, and may wreck the whole or a major part of the structure, splitting open brick walls and making them liable to collapse. Lightning damage to concrete chimneys is usually not as serios and to steel stacks the damage is nil. The best protection is to provide the chimney, no matter how small, with a good conducting system complying with standard codes and then have it examined periodically to insure a complete circuit at all times.

Chimney Services

The most economical way to service a chimney is to have periodic inspections made to record its condition and then, as any progressive condition such as cracking, spalling, weathering is noted, to have them repaired before the damage becomes extensive. Periodic inspection includes a careful ground observation with high powered binoculars or a

climbing inspection at close range. Both should be done by an experienced inspector to insure an accurate evaluation of any maintenance work that may be needed. By having a continuous record of such conditions, faulty operation of equipment is sometimes detected before a serious break down occurs.

Some owners prefer to have their work done by their own maintenance crews, but this usually applies where maintenance consists principally of painting steel stacks. Such jobs are often let to a local "steeple jack" or itinerant chimney repairman who happens by with his equipment. However, the best results are obtained by employing a chimney builder, who is experienced in chimney construction and repair work and who also maintains an engineering office where any special problems can be studied so that the maintenance work can be based on accurate knowledge of the chimney structure and its operation.

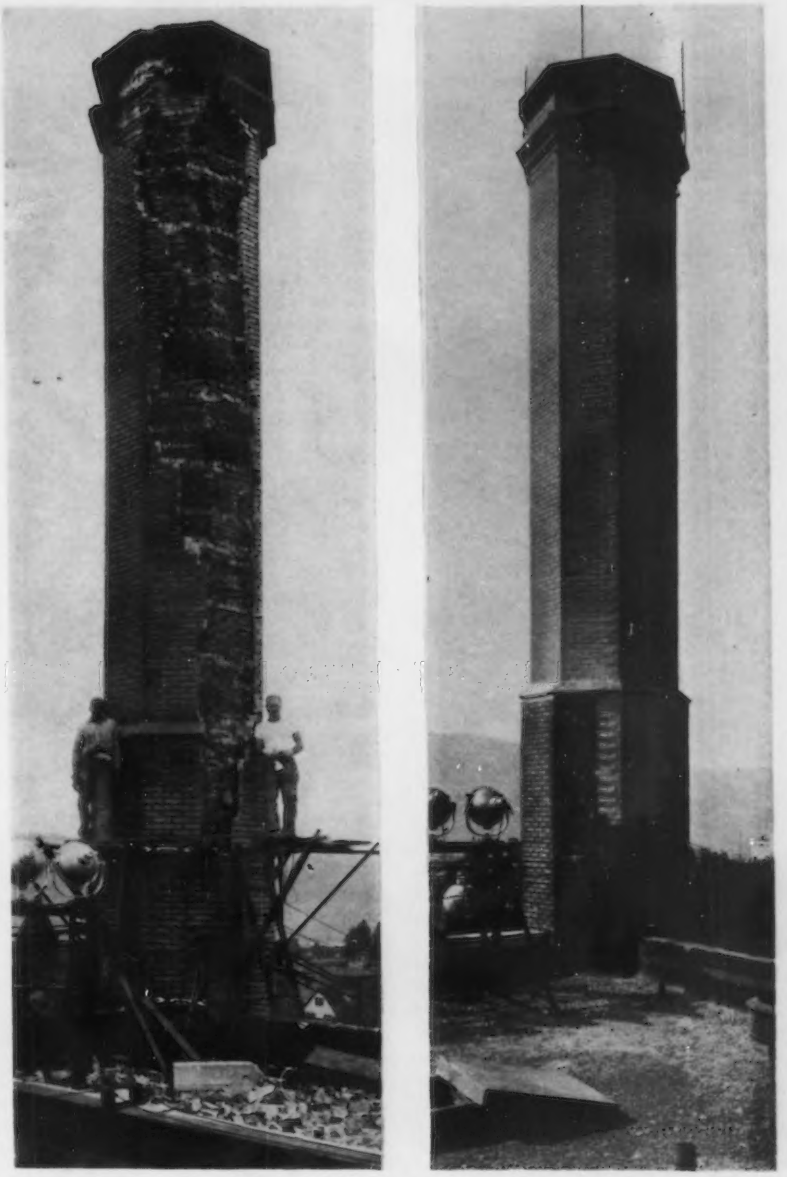
How to Repair

The most frequent maintenance work concerns the repair of cracks and open joints appearing in the outside of the structure. Where the cracks are very small—"hairline"—little or nothing can be done to fill them; but larger cracks, ⅛ inch or more, may be filled with suitable mortar after cutting away loose edges. Similarly, weathered mortar joints (back more than ¼ inch from the face) can be filled. A mixture of Portland cement, sand and shrink reducing admixes is usually applied, although recently epoxy resin products have become available and seem to be satisfactory for such purposes. Larger cracks and spalled areas have to be cut out and built up with cement, sand and metallic bonding compound reinforced with wire mesh. These must be built up in layers to avoid sagging and breaking where too heavy a coat is applied.

Banding part or all of the chimney may be necessary if cracks are large or numerous or the wall is weakened by spalling or softening of concrete or mortar joints.

Often the wall of a chimney is found to be badly cracked or spalled. In older concrete chimneys, this often indicates the loss of circumferential strength due to the rusting of the horizontal reinforcing. In a brick chimney where bonding of the brick courses furnishes the circumferential strength the cracks break their bond. Patching or filling the cracks or resetting broken brick with new ones does not replace the lost strength. It, therefore, becomes necessary to install steel bands with provision for drawing them up tightly around the wall; these supply the needed reinforcement. Bands are usually ⅜ x 3 inches up to ½ x 4 inches in section, according to the size of chimney, and spacing is from 3 to 10 feet according to size, number, and length of cracks. They are placed according to the best judgment of the chimney engineers based on previous experience and knowledge of the structure. Brick chimneys are more likely to need bands than concrete because of the many mortar joints which may have lost their bond but do not readily show up as such.

After patching and banding, the surface is frequently covered with a protective coating. Many are available and the experienced repairman recommends them according to the individual problem. There are applications of cement, sand and metallic bonding compound; plastic paint products giving a pliable thick-skin protection to bridge little cracks which cannot be filled with mortar; epoxy resin paints which are scrubbed on with fibre brushes.



When lightning struck this brick chimney, it was given emergency repair and lightning rods were added.

Encasements

In some cases where the chimney wall has weakened, but removal and replacement is impossible because of interrupting service, encasements have been placed around the original structure. This procedure involves a thorough examination of the old structure and its foundation to prevent failure from overloading.

Lining repairs may include repair of cracks, replacement of loose brick or removal and replacement of the entire lining. The lining design, the materials used on construction and other features may have to be changed. This type of work nearly always represents a major operation with time needed for suitable shutdown period to make repairs, or using a temporary stack to keep operations going.

Any repair operation should include inspection of lightning conductor equipment. Sometimes the maintenance work is aimed primarily at putting these parts in order. In any case, the system should be tightened, the cables securely spliced or renewed and the air terminals replaced if badly corroded. The lightning conductor serves to protect the chimney against damage: first by dissipating the electrical field which collects around it and second by providing a low resistance path for the charge to flow over in case lightning actually strikes. Chimneys are seldom damaged where the conductor system is fully continuous and properly grounded. Standard codes specify the approved arrangement of such equipment.

Naturally, ladders, platforms, caps and other appurtenances should be repaired or replaced according to their condition.

Hire An Expert

Although the chimney is one of the prominent parts of any plant, it usually receives the least attention, people pass it by with only a glance and it is not until it is struck by lightning or cracked open by an explosion that much attention is given to it. Consequently, the plant engineer responsible for its upkeep would do well to appoint someone to report on its condition. This is best done by employing an expert on a fee basis to give periodic reports and recommendations. By repairing small defects before they become larger, costly outages and major repairs can be avoided.

Quality of Pulps By 3 New Sulphite Methods

A. Vethe, V. Loräs, and F. Loschbrandt,
Paper Industry Research Institute,
Oslo, Norway

Comparative investigations have been carried out on pulp yield and quality obtainable by the different sulphite pulping procedures using spruce chips.

1. A two-stage method, using a sodium monosulphite solution, pH about 9—10 in the first stage, drawing off as much as possible of this cooking liquor after heating to 125° C. and keeping there for one hour, and finishing the digestion with an acid calcium sulphite cooking liquor of conventional composition at a maximum temperature of 130° C. The method represents a variant of the so-called Kramfors-method.

2. A sodium one-stage bisulphite method, pH 4—4.5, at a maximum temperature of 155° C. with provisions for good impregnation, and

3. A conventional one-stage acid calcium sulphite method carried out, however, under very moderate conditions as to acid composition, combined sulphur dioxide 1.2 g/100 ml, and temperature, 118° C.

The yield in the two-stage process appeared to be very much influenced by the amount of combined sulphur dioxide available at the beginning of the second stage (composed of combined sulphur dioxide transferred from the first stage and supplied by the calcium acid in the second stage), the yield decreasing strongly with decreasing available combined sulphur dioxide, the comparison being made at the same degree of delignification. On the same basis of comparison, the yield for the two-stage process, under conditions giving approximately maximum yield, was from 3—3.5 to about 4.5 per cent higher (bone dry pulp, bone dry wood basis), depending on the degree of delignification, than for the two other processes, where the yields were approximately the same.

The cause of the difference and of its dependence on available combined sulphur dioxide in the second stage, is briefly discussed. On the basis of recent discoveries as to the behavior of hemicelluloses, especially glucomannan, under different pH conditions during digestion, it is assumed that the effects are caused by the competitive action of hydrolysis and crystallization tendency.

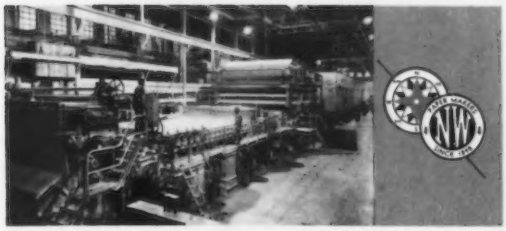
The brightness of unbleached pulp was, within the range investigated, somewhat higher for the bisulphite pulps than for the two other types of pulp, likewise the chlorine consumption, comparison in both bases carried out at the same degree of delignification. The limits for maximum yield of screened and bleached pulp seemed to be about 54 per cent and 50—51 per cent (wood basis) for the two-stage process and for the two other processes, respectively. A digestion to a higher yield than about 57—58 per cent, Kappa No. about 34 (two-stage method), and 55—56 per cent, Kappa No. about 39 (other methods), increased the chlorine consumption excessively without any appreciable increase in yield of bleached pulp.

The two-stage pulps showed very much the same beating and papermaking properties as those characteristic for the conventional acid sulphite pulps of the greaseproof type, only more so. More extensively delignified unbleached two-stage pulps and bleached pulps were thus more difficult to dewater than the two other types of pulp compared at the same °SR. The bisulphite pulps were far more free than the other pulps and a high strength was obtained at a low °SR. They were characterized by a high tear even at a comparatively high tensile strength. The strength obtainable, tear excepted, was otherwise high both for unbleached and bleached pulp. The greaseproof properties (flame test) of the two-stage pulps were very good. The scattering coefficient of the pulps decreased in the order bisulphite pulps, acid sulphite pulps and two stage pulps.—*Summarized from, Norsk Skogindustri, May, 1960.*

B. R. CHRISTENSEN

Dryer Section, No. 6 Fine Papers Machine, the Northwest Paper Company, Brainerd, Minnesota

The Northwest Paper Company



Installation and successful start-up of No. 6 machine completed the current expansion and renovation program at the Northwest Paper Company's Brainerd, Minnesota, mill. This 200" Beloit Fourdrinier machine has increased daily production of the famous Northwest Pedigreed Papers from 80 to over 200 tons a day. For further details and views, please turn the page.

details of Northwest's new No. 6 machine at Brainerd, Minnesota Designed to run in the 2000 fpm range, this 200″ Beloit machine produces Northwest's high-grade writing, printing, and converting papers. Addition of No. 6 machine has tripled production at the Brainerd mill. **(a)** Smoothing press following third suction press; **(b)** straight-through press featuring automatic suction pick-up and sheet-transfer arrangement; **(c)** Beloit pneumatic reel designed to wind 60″ parent rolls; **(d)** motor-operated Beloit streamflow valve; **(e)** Jones-Beloit benchboard controls at press position; **(f)** wet-end Beloit differential-drive units; **(g)** twin open-side Beloit calender stack.

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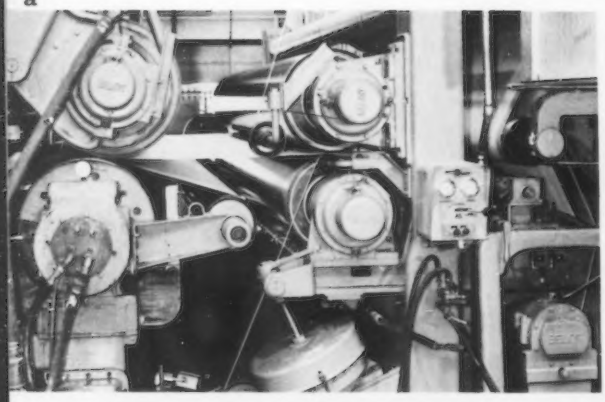

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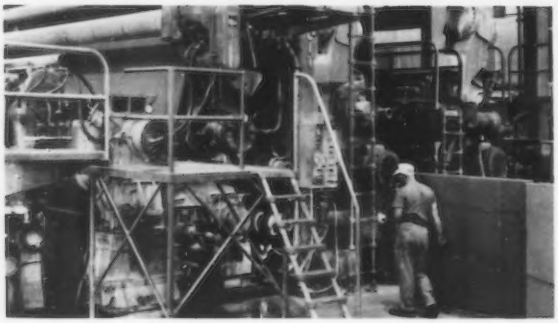

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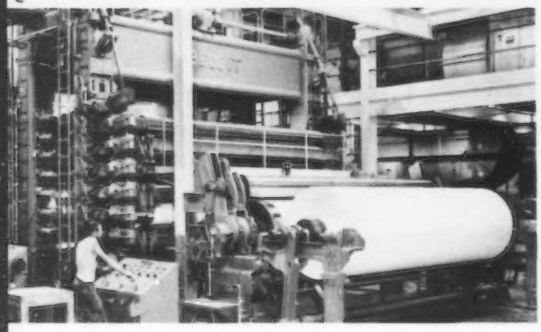

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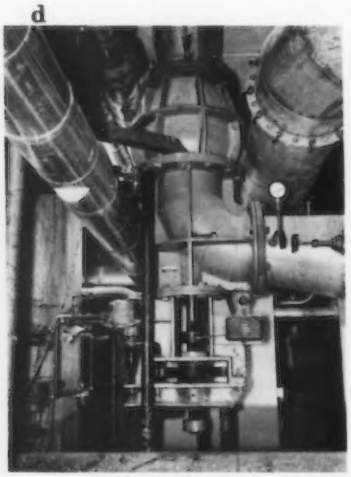

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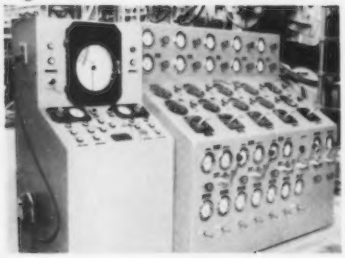

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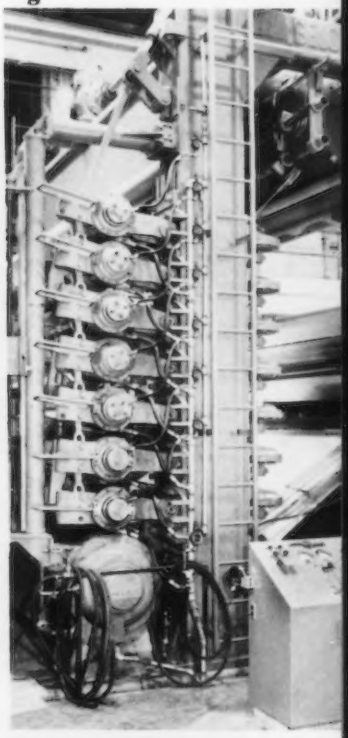

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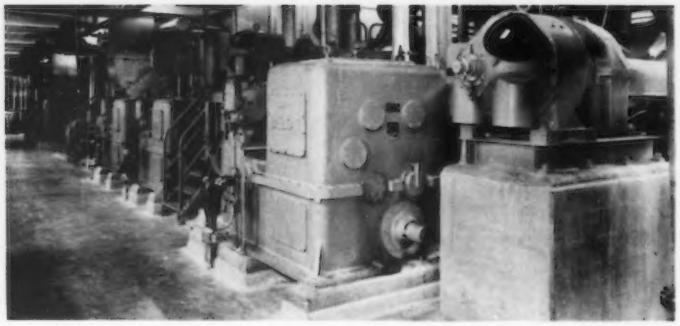

This insert lithographed on Northwest Velopaque Text.

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Pulp Refining—Comparing a Valley Beater, Ball Mill and Commercial Jordan

B. K. Moyer,
Ass't. Director of Research,
Oxford Paper Co., Rumford, Me.

The two most popular laboratory tools in the United States for the evaluation of papermaking pulps are the Valley beater and "ball" or "pebble" mills. Both are used by the Oxford Paper Co., the ball mill for routine control tests, the Valley beater for research purposes. We have long been aware of the dissimilarity of treatment imparted by these units. Production data also showed conclusively that these laboratory units could be seriously misleading in some respects when designing furnishes to meet a set of specifications.

We, therefore, methodically compared mill jordans to these laboratory units. We employed only jordans which were pre-refining a pulp stream, prior to blending with other furnish components. The refined pulp was compared with the same pulp beaten in a ball mill or Valley beater. This paper reports the results of one of these comparisons on a northern, bleached, dried softwood kraft.

Description of Refining Units

Jordan: Jones Majestic; Plug ¼-inch stainless bars, 60 long, 60 short; Shell ½-inch bronze bars, number unknown; Drive 350 h.p. synchronous motor; Energy measurement recording wattmeter; Stock measurement Trimbey meter; Consistency, 3.25 per cent O.D.; and Throughput, 13.8 A.D. tons/day.

Valley Beater: Conforming to TAPPI Standard T200-m-45 except that bed plate filling is routed to ⅛ inch below bed plate bars. This modification speeds up the action of this unit to a level about twice as fast as for a standard unit. Sampled 2 liters at each beating interval.

Pebble Mills: Abbé Type C; porcelain, 9.7 inches id x 13.3 inches deep; Volume: 16:53 liters; Pebbles: flint, 9 lbs., 70 pebbles; Vol.: 1770 ml; Speed: 60 r.p.m.; Charge: 90 g O.D. pulp at three per cent O. D. consistency.

Sheetmaking: TAPPI throughout except do not use British disintegrator (instead we disperse at 0.31 per cent consistency, slow speed agitation). Water: Caisson Well, 15 p.p.m. $CaCO_3$ hardness.

Calculations: All based on conditioned weight. About seven per cent moisture, 25 x 40—500 ream.

Comments

The results presented are typical for several types of fibers, coarse and fine, dried or virgin slush. They are also typical for three different jordans, whether equipped with ¼ inch or ⅜ inch bars in all stainless or the mixture mentioned above. The low throughout in the above case of 13.8 tons per day, for large jordan, results in unnecessarily high unit energy usages but does not invalidate the data. It may, however, lead to better stock properties for a given energy usage. This remains to be determined. Also, we must caution that the intensity of jordaning was varied by setting up the plug. The refining conditions, therefore, varied with each point, whereas they are nearly constant during ball milling or Valley beating, where only time is changed.

Results Obtained

At equal freeness the jordaned pulp was lower than the Valley beaten pulp in apparent density, burst, fold and Gurley. The jordaned pulp was higher than the Valley beaten pulp in tear, opacity, brightness and rate of drainage.

The jordaned pulp was lower than the ball milled pulp in apparent denity, tear, fold, Gurley, drainage rate and free shrinkage; it was highest of all in brightness and opacity, the ball milled pulp lowest in the latter two characteristics.

At equal bulk the Valley beater was closer to predicting jordaned burst, tear and drainage. Otherwise, the two lab units were about equally displaced from the jordan.

All three units produced essentially equal tear at a given burst or tensile strength.

There was no general correlation between TAPPI drainage time and freeness or Gurley, but there are signs that the latter two are very closely related.

There was no general correlation between tensile strength and elongation or free shrinkage, but the latter two may be related.

Inspection of the fibers indicates that ball milling produces considerably more hinge-joints on fibers than the high speed units. This imparts to the ball milled stock many of the attributes of "Curlation" such as high free shrinkage, drainage rate, and elongation and lower stiffness, etc.

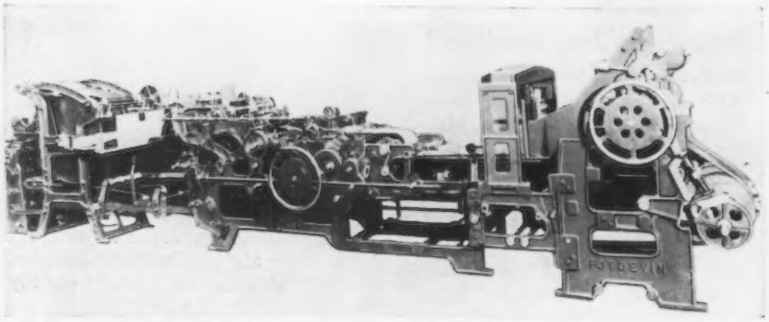
In many papermaking problems it is desirable to obtain water hold-out on the wire to obtain good formation. The jordan performs this function very well, slowing up the stock while developing the pulp more desirably in nearly all respects than the lab units.

The high jordaned opacity and brightness are definite assets to us, while its inability to develop very high sheet density and burst may be serious shortcomings in other applications.

The observations made above must of necessity be restricted to our particular refining devices and to fibers of similar nature. Hardwood pulps, for example, correlate with difficulty if at all, and therefore, may be exempt from the observations reported.

Summarized from a paper presented by D. J. Kraske at the Spring Meeting of the Maine-N.H. TAPPI, June 17, 1960. As presented the paper was profusely illustrated with photomicrographs and tables and graphs of the data provided.

NEW EQUIPMENT & SUPPLIES



MODEL 83 SOS BAG MACHINE includes the production of the popular 20-lb. and 25-lb. "shorty" sizes, now widely used in supermarkets. In a recent report, Potdevin Machine Co. advised that dimensions of the popular bags are 8⅛-inches x 14⅜-inches x 6-inches for the 20-lb. size and 8⅛-inches x 16-inches x 6-inches for the 25-lb size. The model 83, the report adds, will also produce a full range of standard grocery bags from 8 through 20-lbs. The machine turns out from 225 to 325 bags per minute. A flexographic press may be attached to a Model 83 Self Opening Square Bag Machine for personalizing bags with market name or advertising messages. Additional information may be obtained from Potdevin Machine Co., 285 North Street, Teterboro, N. J.

Plastic Corrosion Resistant Linings Are Sprayable

Pfaudlon 301, a sprayable coating of Penton in water-suspension, has been introduced by The Pfaudler Co., a division of Pfaudler Permutit Inc., Rochester, N. Y.

Pfaudlon 301 plastic coating can be applied to desired thickness (20 to 40 mils) with as few as two applications. Additionally, (1) parts do not require preheating as in existing dry-coating techniques, (2) complex shapes can be easily covered; and surfaces not requiring the coating can easily be excluded.

Penton is a chlorinated polyether polymer developed by Hercules Powder Co. It has almost universal resistance to corrosion at temperatures to 250° to 275° F., and high resistance to abrasion and impact damage. Pfaudlon 301 is applied in approximately the same manner as are organic suspensions: the surface to be coated is first cleaned by sandblasting or other methods; a film of suspended resin is then applied with standard spray equipment; water is driven off and the coating is fused to the metal at 400° to 500° F. Pfaudler believes that the water-spraying technique is superior because elaborate safety measures are not needed to guard against toxicity and flammability.

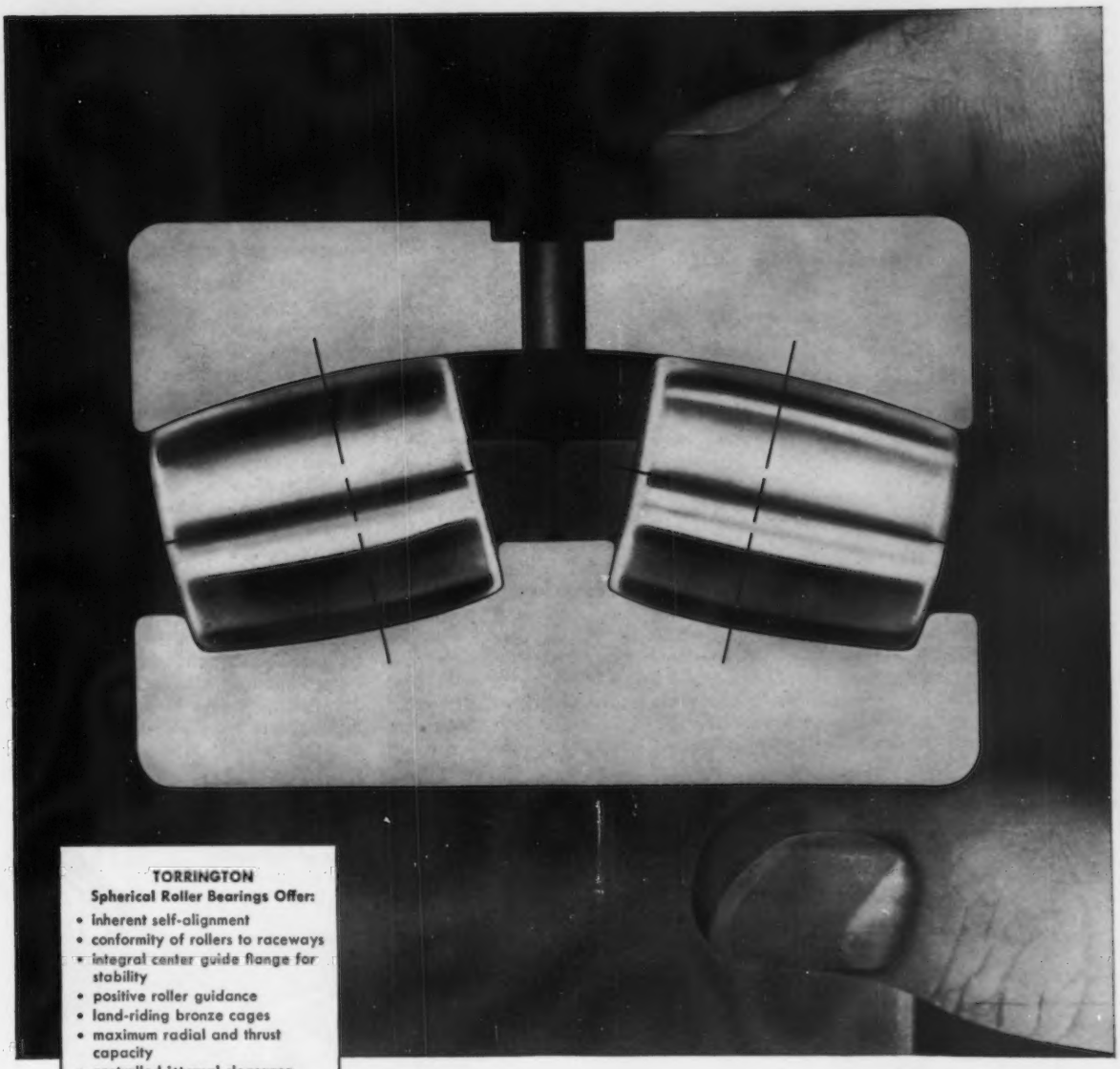
The company believes that the Pfaudlon 301 will not compete to any significant degree with glassed-steel or the reactive metals, but will definitely become a factor where fluorocarbons, rubber, vinyls, epoxies and other plastic materials are now being used. The cost of Pfaudlon 301 will vary with the application; however in general, the company feels that it will be less expensive than fluorocarbons and more expensive than materials like rubber and vinyl resins.

After a year's field test experience on such items as interior and exterior tank linings, pumps, flow meters, valves, centrifuge parts, drum dryers, fume ducts, and filters; Pfaudler is making the coating available on a commercial basis. Three firms have recently been licensed to use the process: American Durafilm Co. in Boston, Mercer Rubber Co. in New York City and Electrochemical Engineering and Manufacturing Co. of Emmaus, Pa.

Jib-Boom Crane Without Gears, Cable, Winch

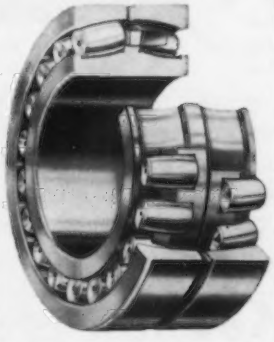
Focowil Corp., announces the Model F-6600ZX Foco-Crane, an all hydraulic jib-boom type crane having design features which enable driver alone to load and unload

almost anything, in bulk or in units of up to 3.3 tons, on open bed trucks and trailers. The elimination of gears, running cables, pullies, winch and similar wear components is made possible by a fully articulated boom which elevates, depresses, turns, telescopes and "elbows." Crane pillar is side mounted for maximum reach and strength with minimum weight. As shown, boom folds and telescopes in seconds into a 15-inch space athwart truck channels for travel. In this position, the crane's center of gravity is centered on truck and is only about 6" above platform. Two hydraulic support legs reduce frame



TORRINGTON
Spherical Roller Bearings Offer:

- inherent self-alignment
- conformity of rollers to raceways
- integral center guide flange for stability
- positive roller guidance
- land-riding bronze cages
- maximum radial and thrust capacity
- controlled internal clearance
- electronically selected rollers
- even load distribution
- long, dependable service life



Shaped for Stability!

The asymmetrical shape of each roller in Torrington Spherical Roller Bearings contributes directly to operating stability and long service life.

The maximum roller diameter is not at the center of the roller. Located towards the center flange, it insures geometric positioning of the roller for positive guidance with free rolling action.

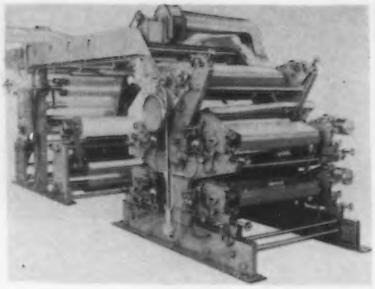
The roller shape also approaches that of a tapered roller. Lines extended from the roller-to-race contact zone converge at the roller and bearing axes. This approach to true conical rolling action further assures stability.

These are two more reasons why Torrington Spherical Roller Bearings operate cooler, quieter and with greater stability. For the ultimate in bearing performance and service life, always specify *Torrington* Spherical Roller Bearings. Send for new Torrington Spherical Roller Bearing Catalog #258.

progress through precision **TORRINGTON BEARINGS**

THE TORRINGTON COMPANY South Bend 21, Indiana • Torrington, Conn.

stress and prevent tipping during operation. The crane is standard with: dual controls, all cylinders double acting and all rods hard chromed. Maximum lifting height, 24 feet; maximum depression, 4 feet 5 inches below ground level; maximum reach from center of truck, 17 feet; swing angle, 280°; weight installed about 1900 lbs. Lifting capacity is 2,200 lbs. at maximum reach up to 6,600 lbs, on short boom. Safety valves prevent overloading.



Offers Small Size 4-Color Single Drum Press

To meet accurate register color printing on narrower web widths of extensible films and for shorter job runs, the Hudson Sharp Machine Co., Green Bay, Wis., recently introduced its A-8 Single Impression Cylinder Flexographic Press.

According to R. E. Jansing, sales manager, the small size press is patterned after the larger size four, five and six-color presses.

The A-8 Press is equipped with a 4-color frame as standard, but a fifth color with its own separate impression cylinder can be provided at additional cost. Some of the quality features furnished as standard include: A 30 inch diameter single impression drum with four color stations; engraved ink applicating rolls; continuously running ink rolls; overhead web transport with guide rolls; centershaft unwind and rewind with positive in-and-out web tension controls; newly designed positive locking device for both color and plate cylinder frames which eliminates vibration and bounce and assures maximum facility for accurate adjustment and printing quality.

In addition to the above features listed as standard, provisions are made for the following optional features: Infeed and outfeed web edge controls; turnover arm-type flying splice unwined and rewind for up to 18 inches o.d. rolls; hot air dryer with high velocity jets both between colors and in after-tunnel including chill roll following after-tunnel; web conditioning and viewing equipment; and, separate motor driven tension control for rewinder.

Extra-Wide Penton Sheet Announced For Tank Linings

Extruded Penton sheet in 48-inch wide rolls is now available for lining tanks, vessels, fume hoods and ducts, pipes and other equipment announces National Vulcanized Fibre Co. Formerly, Penton sheet for corrosion-resistant linings was only commercially available in narrow widths. These extra-wide rolls are claimed to cut application costs because more surface area can be covered with a single width. This reduces the number of seams and seaming material required, cuts welding time and expense, and speeds installation.

Penton linings are applied both to existing equipment in the field and to new equipment during fabrication. They may also be used in motor and rail tank cars carrying corrosive fluids. National also supplies Penton sheet in narrow widths. Two stand-

Conical Perforation and Thickness of Material

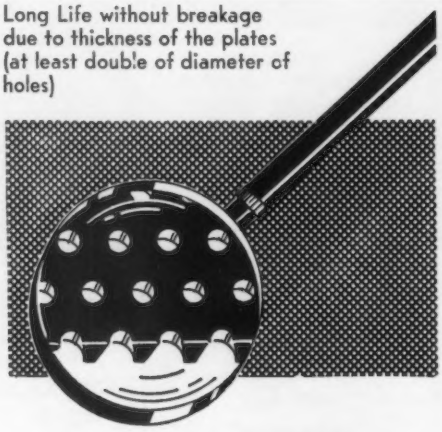
are the principal characteristics of my

Screen Plates

made of brass, bronze or stainless steel

Also:
Cut Plates, complete Screen Drums,
Dandy Rolls for all purposes,
Flat and Rotary Screens,
All kind of Fourdrinier Wires for Paper, Board and Cellulose Mills

Long Life without breakage due to thickness of the plates (at least double of diameter of holes)



diameter of holes down to 0.02" for screens and classifiers of all systems

Proved in most of the European and in many Oversea Ground Wood Paper and Cellulose Mills

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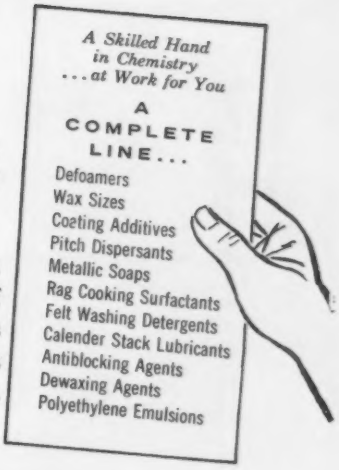
Hermann Finckh

Metalltuch-und Maschinenfabrik
Reutlingen/Germany

make cleaner paper with NOPCO® DEFOAMERS backed by Nopco know-how

One of the causes of a bad run of paper can be foam. Bubbles that carry fiber, size or color on their surface burst and leave light spots. Those that carry filler or dye leave dark spots. Either way, the sheet won't pass inspection.

Many variables contribute to foam formation. Since each mill has its own distinct foaming problems—because of differences in equipment, type of water, chemicals used and running speeds—it takes a wide range of defoamers to meet them all. Let your Nopco specialist work with you to develop the best system for your conditions. Write for specific information and for literature.



NOPCO CHEMICAL COMPANY
60 Park Place, Newark, N.J.

Plants: Harrison, N.J. • Richmond, Calif. • Cedartown, Ga. • London, Canada • Mexico • France
Manufacturing Licensees Throughout the World

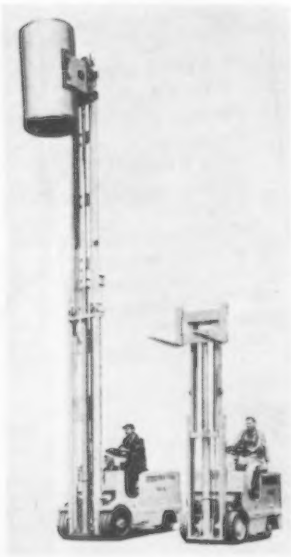
ard sheet thicknesses are available —.040-inch and .062-inch. Other thicknesses are available on request. The heavier gauge material is designed for conditions of severe abrasion. Also supplied are Penton welding rods, welding seamers, and corner strips for use in installing the Penton lining. Additional information is available from National Vulcanized Fibre Co., 1060 Beech St., Wilmington 99, Delaware. Penton is Hercules Powder Co.'s trademark for chlorinated polyester.

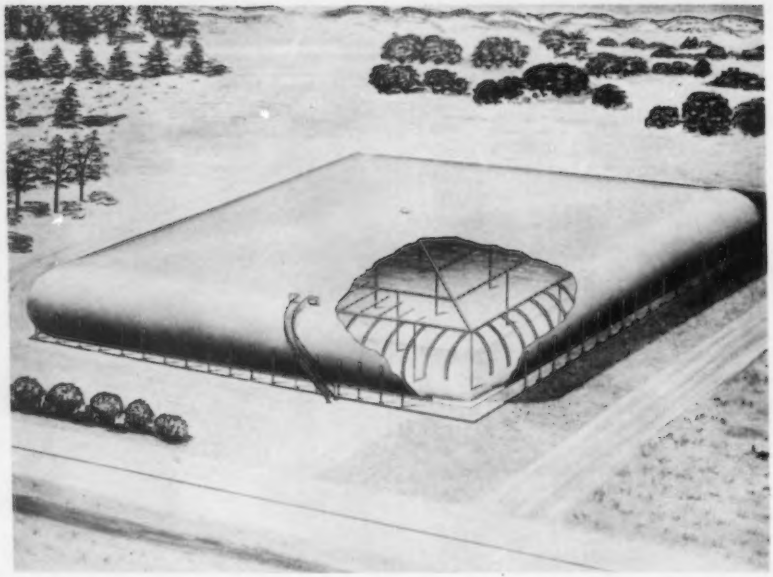
Extra High Lift Mast Reaches to 38 Feet

Using a displacement-type cylinder, engineers of the Yale Materials Handling Division, The Yale & Towne Mfg. Co. have designed an extra high lift mast to handle rolls of paper with the standard Model 2-H paper roll clamp. Installed on Yale K-51 electric trucks, the lift height of this model is 28 feet to the centerline of paper roll rotation. Lift speeds are 40 feet per minute with a full 5,000 pound (clamp capacity) load and 65 feet per minute empty. Lowering rates are 80 feet per minute loaded and 55 feet per minute empty.

The application of the displacement cylinder here is intended to provide a maximum diameter piston rod (for strength) moved by a minimum quantity of oil (for economy of space), in addition to greater lift speed.

Trucks can be equipped with either single or dual drive wheels as the particular application requires. Roll clamping pressure is maintained and accidental dropping prevented by use of a clamp safety circuit. Thus the operator can not release a load until it is resting on a firm base. This high lift mast line is adaptable to the entire Yale 51 series up to a capacity of 10,000 pounds. Trucks in this line are available as gasoline, LP-gas, or electric versions. Maximum mast height possible, in this high lift mast line applicable to the 51 series, is 38 feet to the centerline of paper roll rotation, a full ten feet more than shown in the illustration.





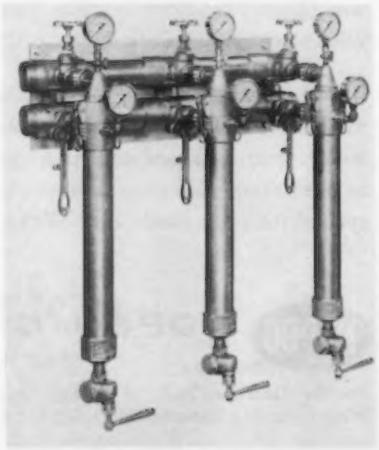
THE WATER STORAGE TANK shown in this artist's sketch of the Cylindroid, is a low-cost, ground-level, high capacity reservoir developed by Graver Tank & Mfg Co., East Chicago, Ind., Division of Union Tank Car Co. The tanks are said to provide approximately 16 per cent more storage capacity than do comparable cylindrical tanks. The Cylindroid also costs less to build, because it makes possible the use of lighter steel; requires a minimum of shop forming and prefabrication; can be erected on the site with a small crew and light equipment; fit up is all straight-line and welding is all downgrade. Because of its low height, the Cylindroid can be easily screened with trees and landscaping.

Filters, for Chemicals or Water, are Wall-Mounted

Ronningen-Petter Co. has developed a line of wall mounted Fluid Filters, quick coupling, small, lightweight, compact, so as to reduce floor space. These are suited for water, oils, or chemicals, hot or cold.

They are used for prevention of nozzle plugging; to eliminate iron (ferric oxide) and pipe scale; for clarification of viscous liquids; for protecting hydraulic valves and flowmeters, and other critical filtering applications. Elements are rated to withstand 150 p.s.i. differential pressures without collapse. These filters may be backwashed and blown-down "on the run". Labor costs for service are said to be reduced because these filters are all quick coupling in a matter of 60 seconds, no tools are required. All units are sealed at both ends so no dirty unfiltered particles can sneak around the ends.

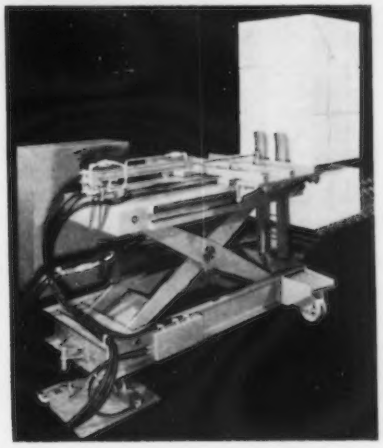
Rated 5 to 350 g.p.m.; 10 to 700 mesh; pressures to 200 p.s.i.; tem-



peratures to 450°F. Available in bronze; steel; 316 stainless steel throughout; monel metal throughout; and aluminum. They are made 2, 3 and 4 units in parallel. Bulletin #76023 covers ratings, particles retention, industrial uses and other engineering data; and is available from Ronningen-Petter Co., 6870 East YZ Ave., Vicksburg, Mich.

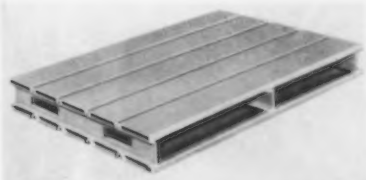
Pulp Bale Stacker Has Versatility

Lamb-Grays Harbor Co. has announced an addition to its line of pulp bale stackers in their Fork Lift



Pulp Bale Stacker. The machine is fully automatic, hydraulically actuated, and will hold, stack, and discharge both uniform and varying sized pulp bales. It stacks any preset number of bales within its capacity and discharges the stacks to conveyor or for fork truck pick up.

It will also stack untied bales, and swing to deposit them on pallets for wrapping and strapping into "Jumbo" packages. Further information can be obtained directly from the manufacturers: Lamb-Grays Harbor Co., Inc., P.O. Box 359, Hoquiam, Wash.



CORRUGATED ALL-STEEL PALLET in standard size for the first time is now offered by Palmer-Shile Co., 12664 Mansfield, Detroit 27, Mich. The welded pallet is reinforced by center braces for extra heavy duty and has four-ways entrances for fork trucks. Standard sizes are in both single and double face design, 48 x 40 inches and 48 x 48 inches.

Adds Another Size Centrifugal Cleaner Line

An additional size Centri-Cleaner, the No. 609, with a capacity of 180 g.p.m. has been announced by The Bauer Bros. Co., Springfield, Ohio. Its head diameter is nine inches.

The No. 609 is designed for use on machines making high grade papers. It is also recommended in the secondary and tertiary stages of No. 620 installations where volume is correct. Pressure drop across the cleaner is 50 p.s.i.

Efficiency of the cleaner falls between the smaller No. 606 and the larger No. 622. Even though capacity of the unit is double that of the No. 606 and just slightly under that of No. 622, the cleaner is "competitive" in price with the smaller No. 606, according to a company spokesman.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	June 11	June 18	June 25	July 2	July 9
1960	99.3r	100.3r	96.7r	89.1r	56.6
	June 13	June 20	June 27	July 4	July 11
1959	95.6	96.7	96.0	71.7	71.5

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.7	97.9	98.3	97.0	97.9‡	96.3‡	—	—	—	—	—	—	—
1959	87.8	90.5	93.2	94.4	95.5	95.6	84.5	96.0	92.4	97.4	96.2	86.6	94.0

‡ Preliminary

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

COMPARATIVE YEARLY SUMMARIES

	1953	1954	1955	1956	1957	1958	1959	1960
Year to Date	94.2	91.6	95.8	99.3	92.3	85.8	91.2	96.4
Year Average	92.3	91.6	96.2	97.9	90.4	87.0	94.0	—

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	June 11	June 18	June 25	July 2	July 9
1960	96	93	94	90	50
	June 13	June 20	June 27	July 4	July 11
1959	98	98	98	82	56

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	—	—	—	—	—	—	—
1959	89	94	95	94	96	96	83	97	92	96	94	80	92

† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING July 9, 1960	LAST WEEK ENDING July 2, 1960	CUMULATIVE TO DATE Jan. 1 to July 9, 1960, incl.
% Activity	50%	90%	92%
Total	174,810	308,618	8,350,288
Containerboard—Domestic Use	98,685	160,941	4,278,411
Liner	69,478	105,925	2,850,218
Corrugating Material	26,549	50,035	1,287,658
Chip & Filler Board	2,658	4,981	140,535
Boxboard—Domestic Use	48,840	91,092	2,615,694
Folding	25,678	52,354	1,564,226
Set-Up	3,847	11,984	297,521
Special Food Board	19,315	26,754	753,947
Other Paperboard	27,285	56,585	1,456,183
Containerboard Type	14,018	29,666	691,765
Boxboard Type	13,267	26,919	764,418
Total Orders			
Received	182,700	317,772	
Unfilled End of Week	449,939	450,185	

PTJ NEW LITERATURE

A Mill and Its Men

Takes the reader on a pictorial trip through a modern paper mill and tells the story of a seasoned and experienced team working together in the manufacture of Wausau papers. Booklet. Wausau Paper Mills Co., Brokaw, Wis.

Air Power Tensioners & Sealers

Describes eight tensioners adjustable to supply uniformly the exact strap tension desired and seven pistol grip and double handle sealers. Also includes application stories of the tools in actual use. Folder. Signode Steel Strapping Co., 2600 North Western Ave., Chicago 47, Ill.

Armorox Thermocouples

Explains the metal-sheathed, ceramic insulated construction of these thermocouples and cites typical applications. A table gives complete specifications of various Armorox thermocouples available. Bulletin P 1281A. Bristol Co., Waterbury 20, Conn.

ACAP Pumps

Shows by cross-section diagrams the operation of ACAP pump's pneumatic control system built into the unit's body. This system uses a pneumatically operated piston to replace the original gear train mechanism. Leaflet 08B9548. Allis-Chalmers, Milwaukee 1, Wis.

Chemical Products From Corn

Discusses properties, types and current and suggested uses for Argo chemicals. 4p Folder. Corn Products Div., Corn Products Sales Co., 10 E. 56th St., New York 22, N. Y.

Control Valve Catalog

Presents engineering, specification and purchasing information on the complete line of P-K Paul control valves. GV-101. General Kinetics Corp., 197 S. Van Brunt St., Dept. C, Englewood, N. J.

Job Applications for The Prime Mover

Describes plant conditions and operations where powered platform trucks can reduce costs. Also discusses material handling and maintenance and service work in detail. Prime-Mover Co., Muscatine, Iowa.

Metameter Telemeters

Includes principles of operation; types of telemeter; application to various measurands, including pressure, water level, temperature, flow, motion, and position; and electrical quantities. 52p Bulletin M1715. Bristol Co., Waterbury 20, Conn.

Paper Knives

Describes and illustrates Mirro-Keen, the exclusive finish for paper knives. Also includes micro-photographs plus case history reports by several users of these knives. Bulletin 400. Simonds-Worden-White Co., 1101 Negley Pl., Dayton 7, Ohio.

Two-Stage Fiber Presses

Points out features claimed to give greater efficiency and economy for this method in the application of these two-stage fiber presses in the pulp and paper field. Bulletin FP 360. V. D. Anderson Co., 1935 W. 96th Street, Cleveland 2, Ohio.

One-Piece Pipe Insulation

Describes the thermal and physical characteristics of Mono-Kover, a one-piece pipe insulation for service from below zero to 350 F. Also discusses seven different factory-applied facings with which this is available. Bulletin J-660. Baldwin-Ehret-Hill, Inc., 500 Breunig Ave., Trenton 2, N. J.

Plug-in Bus Duct

Contains application data for these ducts. Also includes drawings, dimensions, specifications, engineering and test data as well as information needed to lay out, specify and install this type of bus duct. Bulletin 30-661. Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

R/M Recommendation Chart

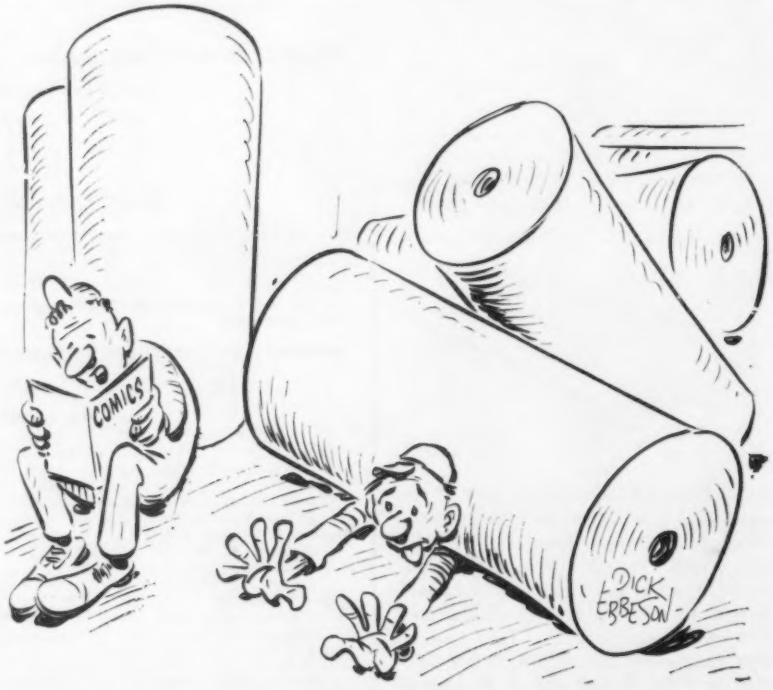
Shows maintenance and engineering personnel the proper packing types to choose for specific applications. This wall chart suggests seven basic packing types for 95 per cent of all packing needs. Raybestos-Manhattan, Inc., Packing Div., Passaic, N. J.

Sumstar Dialdehyde Starch

This 40-page technical bulletin describes the physical and chemical properties and applications of dialdehyde starch, a new product with special applications in papermaking. Technical bulletin 6-129, Miles Chemical Co., Elkhart, Ind.

Unit and Blast Heaters

Gives detailed description of GRID cast iron steam heat transfer surface unit heaters, (both horizontal and down below), blast heaters and radiators . . . with general treatment on corrosion in unit heaters. Catalog GP 956-R4-1-60. D. J. Murray Mfg. Co., Wausau, Wis.



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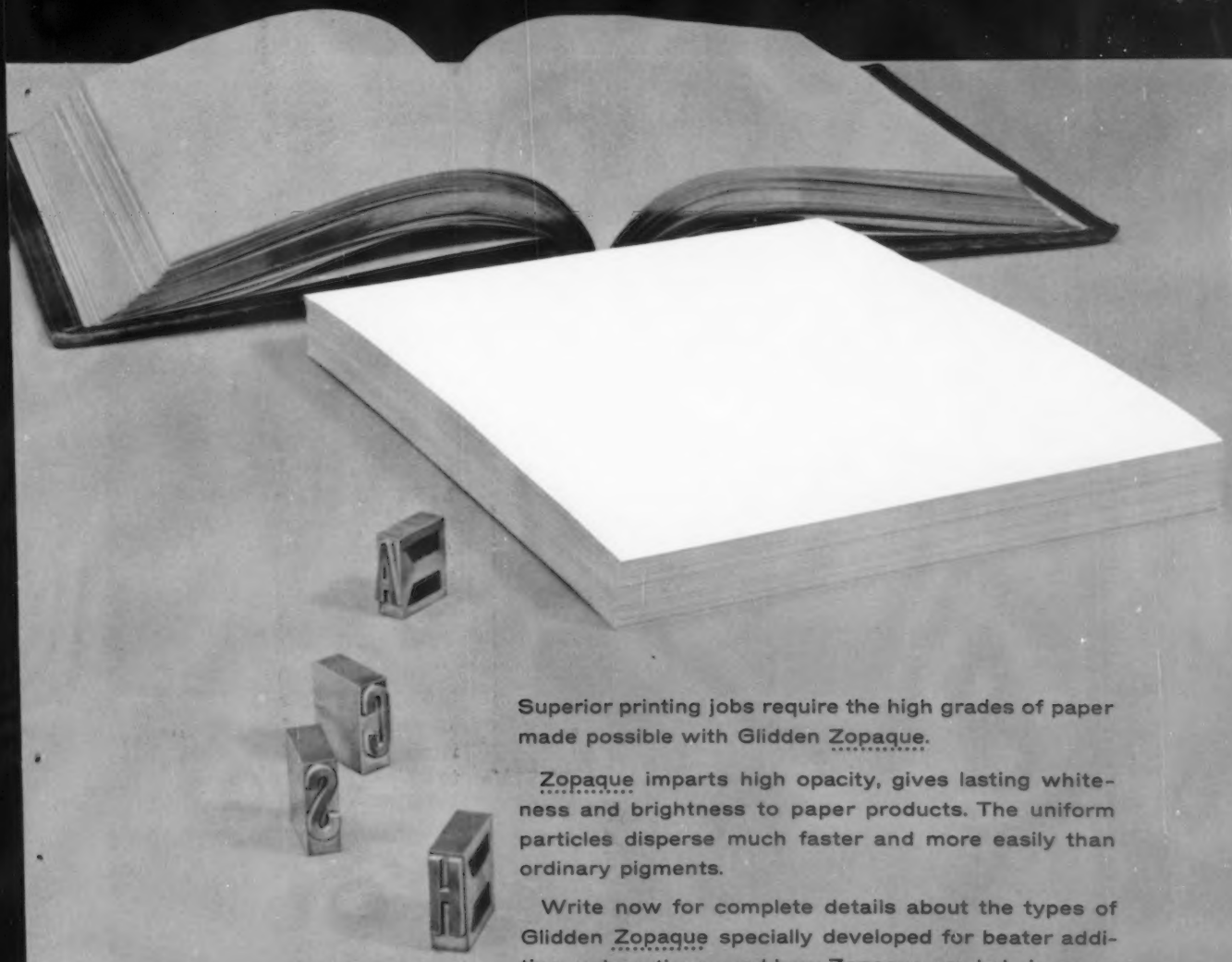
Printing papers with finest reproduction qualities are made with Glidden Zopaque® Titanium Dioxide



Superior printing jobs require the high grades of paper made possible with Glidden Zopaque.

Zopaque imparts high opacity, gives lasting whiteness and brightness to paper products. The uniform particles disperse much faster and more easily than ordinary pigments.

Write now for complete details about the types of Glidden Zopaque specially developed for beater addition and coatings—and how Zopaque can help improve whatever paper products you manufacture.

QUALITY Glidden PRODUCTS

FINEST PIGMENTS FOR INDUSTRY

The Glidden Company
Chemicals—Pigments—Metals Division
Baltimore 26, Maryland

(This advertisement is printed on paper stock containing Glidden ZOPAQUE Titanium Dioxide.)

Conserve water with Lodding Self Cleaning Showers

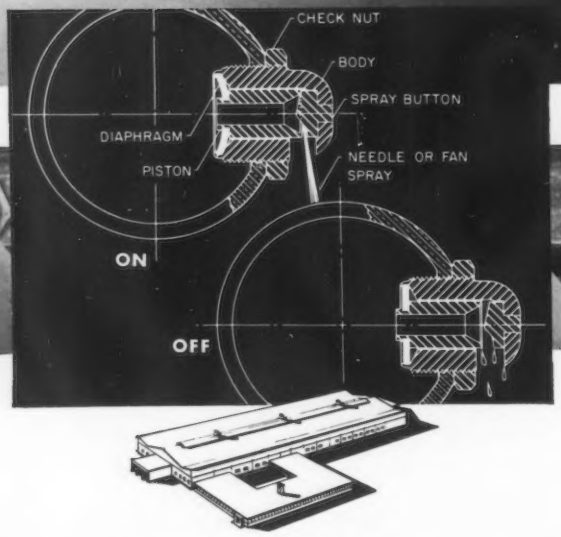
In mill after mill Lodding Showers are conserving water — cutting operating costs — performing effectively.

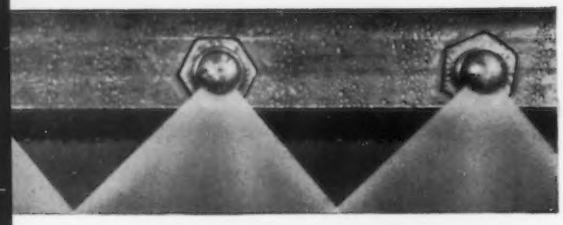
In showers it's the nozzle that counts. And Lodding Nozzles have been engineered to give you the greatest possible showering efficiency, whether your system uses fresh or clarified white water.

Lodding Nozzles are designed with a built-in, sealed piston. In operation, pressure of the water forces the piston against the spray button, which is precision-milled to create the exact spray pattern desired — from an 80° fan to a needle stream.

As particles become lodged in the nozzle, the piston oscillates and automatically frees them. When the water is shut off momentarily the piston retracts. After the water is turned on again there is a brief period before the piston resumes contact with the spray button. During this interval larger particles are flushed from the nozzle.

It will pay you to investigate all the advantages of Lodding Self Cleaning Showers. Lodding, or one of our sales representatives, will be pleased to tell you more about them.





LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS

IT'S A BETTER, BRIGHTER DAY WHEN YOU READ
The New York Times
SMART PEOPLE EVERYWHERE KEEP UP WITH THE TIMES
IT'S A BETTER, BRIGHTER DAY WHEN YOU READ
The New York Times
PEOPLE EVERYWHERE KEEP UP WITH THE TIME
The New York Times

TITANOX® helps make a good paper better

Don't misunderstand us. We're not claiming any credit for the editorial content of the New York Times, one of the world's great newspapers.

But we are proud that TITANOX titanium dioxide is being used to brighten the "rainy-day" bags that help the Times reach its subscribers in the most readable condition. It's this white titanium dioxide pigment that gives this waxed-paper stock the whiteness, brightness and opacity that makes the Times' advertising message stand out.

Because of their uniformity of all properties, TITANOX white pigments are always a favorite—not only for overcoming the transparency caused by waxing, but also for opacifying the highest grades of writing and printing papers. Whether added at the beater or in surface applications, TITANOX always makes a good paper better.

And as it is with paper, so it is with a wide range of other products... there is a TITANOX pigment for anything that needs whitening, brightening or opacifying. Titanium Pigment Corp., 111 Broadway, N.Y. 6, N.Y. In Canada: Canadian Titanium Pigments, Ltd., Montreal.

TITANIUM PIGMENT CORPORATION

SUBSIDIARY OF NATIONAL LEAD COMPANY

TITANOX

7829

PJT NEWS OF SUPPLIERS

K. E. Atwood

P. B. Smith

L. F. Monahan

W. P. Harwood

Bailey Meter Co., Cleveland, Ohio, announces the appointment of three new district managers. K. E. Atwood has been named manager of the Pittsburgh district; P. B. Smith, Seattle; and L. F. Monahan, Denver.

Mr. Atwood joined Bailey in 1937. He worked on the Boston staff until 1948, when he was appointed manager of the Seattle district, the position he held prior to his present appointment. A graduate of Worcester Polytechnic Institute, he holds a B.S. in mechanical engineering. Mr. Atwood succeeds H. R. Fulton who has been appointed a regional manager.

Mr. Smith started with Bailey in 1946. Prior to his present appointment he had been resident engineer in the Portland office, subdivision of the Seattle district. He was graduated from the University of Illinois in 1940, and received a B.S. in mechanical engineering.

Mr. Monahan's Bailey career has centered around the Denver district. He joined the company in 1948, worked in the contract engineering department for 18 months, and was assigned to Denver in 1950. In 1953 he was appointed resident engineer in Salt Lake City (Denver subdivision), and held this position until his present assignment. He was graduated from the University of Wisconsin in 1948, with a B.S. in electrical engineering. He succeeds A. L. Danielsen who has been named a regional manager.

Albany Felt Co., Albany, N. Y., has appointed Wayne P. Harwood sales engineer in the sales territory covering eastern New York and part of Connecticut.

Mr. Harwood attended North Eastern University and held sales positions with the Sylvania Electric Co., and Graton and Knight Co., Worcester, Mass., before joining Albany Felt.

Diamond Alkali Co. has appointed Charles P. Egolf assistant manager of its Southeastern sales office in Memphis, Tenn.

To this newly-created position in which he has been serving since March, Mr. Egolf brings a background of 14 years' experience as a salesman and research chemist. He joined Diamond in 1953 as a field salesman becoming a senior salesman two years later.

Sandoz, Inc., announces the retirement on June 30 of A. T. Hanes, vice president in charge of marketing dyestuffs. Mr. Hanes has been associated with Sandoz in various capacities since 1928. For the future, he plans to devote his efforts to other interests.

Lodding Engineering Corp., Auburn, Mass., has appointed William P. Dapses its exclusive sales representative on the West Coast.

From headquarters in Seattle, Mr. Dapses will service paper mills in California, Washington, and Oregon, as well as Alaska. Canadian mills will continue to be serviced by Pulp & Paper Mill Accessories, Ltd., Montreal, a Lodding manufacturing licensee.

W. P. Dapses

W. S. Gundlach

Mr. Dapses formerly was a sales and development engineer for 14 years with the Wolverine Equipment Co. He holds two patents on high velocity air drying equipment.

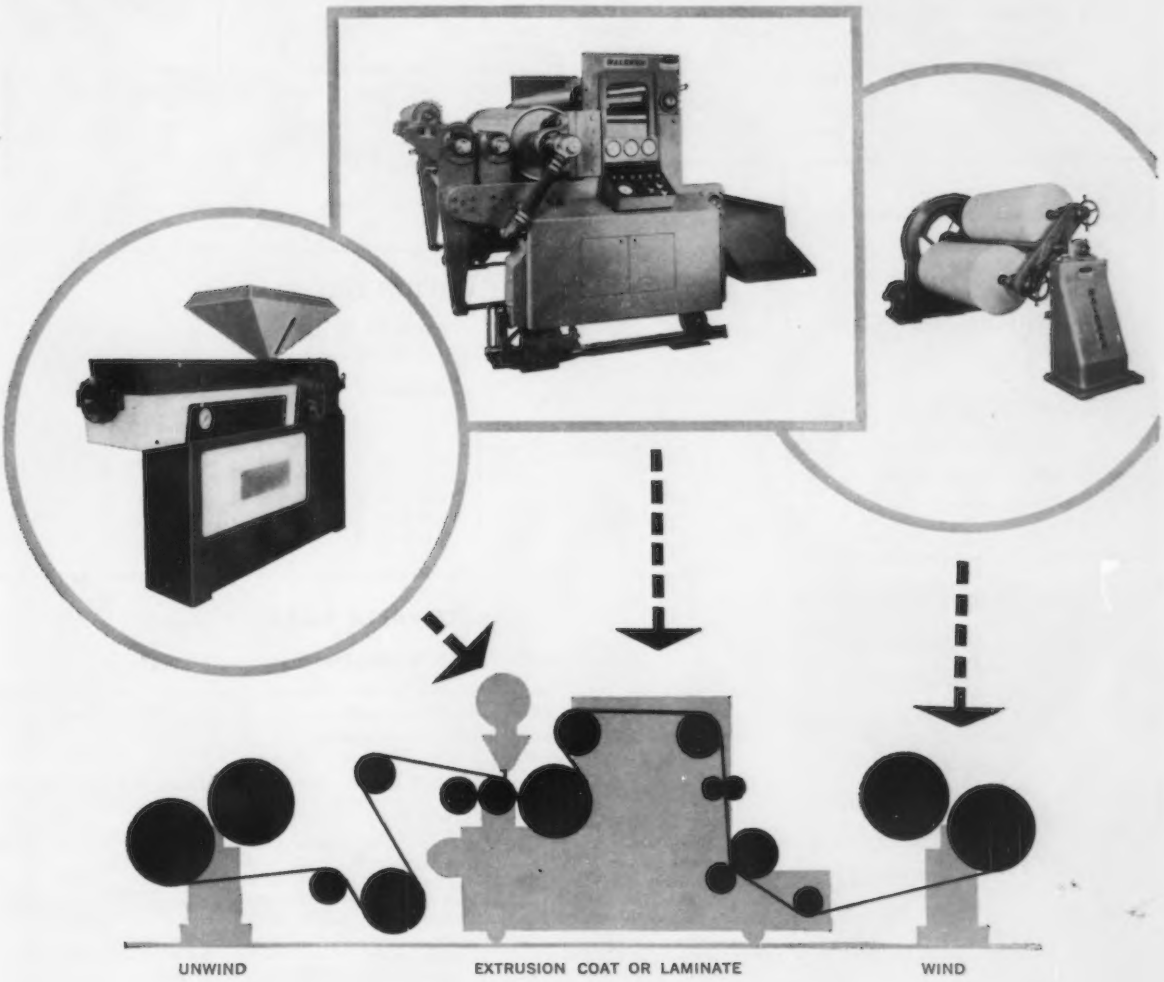
Prior to this, he worked for the Charles T. Main Co., Boston, specializing in the design of high pressure piping for power plants.

John W. Bolton & Sons Inc., Lawrence, Mass., has announced the appointment of William E. Gundlach as sales representative for the firm's knives in the territory including Ohio and western Pennsylvania.

Prior to joining Bolton, Mr. Gundlach worked for the Wheeling Corrugating Co., a subsidiary of Wheeling Steel Corp., the last three years as sales manager in the Pennsylvania territory.

NEW PLANT FACILITY adjacent to the Hartig Extruder factory in Mountainside, N. J., acquired by the Waldron-Hartig Division of Midland-Ross Corp., will be used for the manufacture of new machines developed for the paper and plastics industry.

New Machinery Designs with New Features for
EXTRUSION COATING & LAMINATING



Manufactured in a complete range of sizes by combining our standard units. Buy from a single responsible source, technically competent in web processing and extrusion machinery.

Write for complete specifications and information on the new operating features built into these units.

WALDRON • HARTIG DIVISION
MIDLAND-ROSS CORPORATION
BOX 791, NEW BRUNSWICK, N. J.

WM-560

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PROCESS STUDIES, DESIGN, SPECIFICATIONS, CONSTRUCTION SUPERVISION

PULP AND PAPER MILLS

STEAM, HYDRAULIC AND ELECTRICAL ENGINEERING REPORTS, CONSULTATION, VALUATIONS

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BOSTON, MASSACHUSETTS

CHARLOTTE, NORTH CAROLINA

We are specialists

in

CONTINUOUS DIGESTERS

FRANK B. GREEN INC.

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MASSAPEQUA PARK

NEW YORK

STRENGTH CURVE REFINING IN MINUTES ...NOT HOURS

Using the Bauer-Mead Laboratory Refiner, you can get accurately reproducible data in only a fraction of the time required by other equipment.

For details and bulletin, write or call us. FAirfax 3-5501.

The Bauer Bros. Co.

HEADQUARTERS FOR PROGRESS

1758 Sheridan Ave. • Springfield, Ohio

Prices of Fibers

MARKET WOOD PULP

THIRD QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$ 82.50/ 90.00	$82.50/ 90.00	§$90.00/ —	§$80.00/ —	§$90.00/ —
Bleached Gw'd	$ 97.50/100.00	$97.50/100.00			
Kraft, Blchd.	‡152.00/160.00				§157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		140.00/ —		
Kraft, Semi-bleached.	140.00/145.00				
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡150.00/155.00	‡150.00/155.00	•155.00/ —	•155.00/ —	155.00/ —
Sulphite, Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd.	135.00/ —	135.00/ —	†135.00/ —	•135.00/ —	
Sulphite, Unb'l. Gl'sn		140.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

§ On Dock Atlantic Ports. • Freight allowed. † Varying Freight Allowances.
‡ Depending on Brightness.

COTTON LINTERS

F.O.B. OIL MILLS
WEEK ENDED JULY 12

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	n.a.	n.a.	n.a.	9.00/ —
3	$7.50/7.00	$8.50/7.50	$7.50/7.00	8.50/8.00
4	7.00/6.25	7.25/6.25	6.50/6.25	7.75/ —
5	6.25/5.75	6.00/5.50	6.00/5.50	7.50/7.00
6	5.75/4.75	5.25/5.00	5.25/5.00	6.50/4.50
7	4.75/4.25	4.50/4.00	4.75/4.00	4.25/4.00

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	July 18	July 18	July	July
No. 1 Mixed Paper	$ 7.00/ 9.00	9.00/ 11.00	6.00/ —	11.00/ 13.00
No. 1 News	12.00/ 13.00	12.00/ 13.00	13.00/ —	12.00/ —
Overissue News (Lg. size)	11.00/ 13.00	11.00/ 13.00	18.00/ —	18.00/ 19.00
Mill Wrappers	19.00/ 22.00	13.00/ 15.00	9.00/ —	12.00/ 14.00
Old Corrugated Containers	22.00/ 23.00	19.50/ 20.00	20.00/ —	23.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	30.00/ —	55.00/ —
New Double Kr. Ld. Corr. Cuts	32.50/ 35.00	35.00/ —	35.00/ —	35.00/ —
(Semi-chem. medium)	47.50/ —	47.50/ —	45.00/ —	— / —
New 100% Kraft Corr. Cuts	40.00/ 42.50	— / —	57.50/ —	— / —
New Br. Kraft, Env. Cuts	70.00/ 75.00	70.00/ 75.00	52.50/ —	60.00/ —
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	52.50/ —	55.00/ —
New Br. Kr. Bag Waste Unprintd.	60.00/ 65.00	65.00/ 75.00	60.00/ —	60.00/ —
No. 1 Groundwood Shvs.	25.00/ 30.00	25.00/ 30.00	17.00/ —	32.50/ 35.00
White Newsblanks	47.50/ 52.50	47.50/ 52.50	35.00/ —	55.00/ —
No. 1 Soft White Shvs.	60.00/ 65.00	57.50/ 60.00	60.00/ —	70.00/ 75.00
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	70.00/ —	— / —
Hd. White Shvs.	85.00/ 90.00	90.00/100.00	85.00/ —	85.00/ 95.00
Hd. White nv. Cuts	100.00/105.00	105.00/110.00	90.00/ —	110.00/113.00
Col. Tab. Cards	42.50/ 45.00	42.50/ 45.00	45.00/ —	40.00/ 45.00
Manila Tab. Cards	62.50/ 65.00	62.50/ 65.00	65.00/ —	70.00/ —
No. 1 Col. Ledger	35.00/ 40.00	35.00/ 40.00	40.00/ —	27.00/ 29.50
White Ledger	48.50/ 52.50	50.00/ 55.00	50.00/ —	50.00/ 55.00
Mixed Book & Mag.†	— / —	— / —	12.50/ —	— / —
No. 1 Books§	16.50/ 19.00	14.50/ 16.50	27.50/ —	13.50/ 14.00

† Includes Time & Life; no coarse groundwood. § Not to exceed 10% of groundwood.

CALL HOOKER **FOR TECHNICAL HELP ON ClO_2**

Maybe it's time for a seminar with your operating and technical people on any and all phases of chlorine dioxide generation and bleaching . . . with emphasis placed wherever you wish. There's much we can tell you about the handling, storage, and use of sodium chlorate, too. Just give us a call or write us a letter and we'll gladly place our technical service group at your disposal.

HOOKER CHEMICAL CORPORATION
1807 Forty-seventh Street, Niagara Falls, New York

Sales offices: Buffalo Chicago Detroit
Los Angeles New York Niagara Falls
Philadelphia Tacoma Worcester, Mass.
In Canada: Hooker Chemicals Limited, North Vancouver, B.C.

HOOKER CHEMICALS PLASTICS

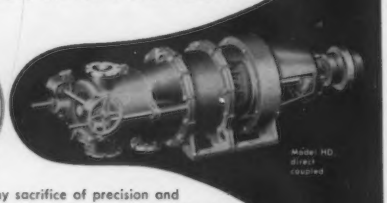
Knox Felts

KNOX WOOLEN COMPANY

CAMDEN, MAINE

America's First Manufacturer of Endless Paper Machine Felts

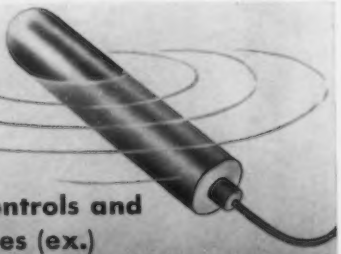
NEW, IMPROVED DESIGN
SAVES 30% IN INITIAL COST



Without any sacrifice of precision and quality in stock preparation, the re-engineered Morden Stock-Maker for beating, and Morden Stuff-Maker for jordaning can now be installed with savings up to 30%. To get all the facts on new developments at Morden, write.

MORDEN MACHINES COMPANY : PORTLAND 1, OREGON : 3420 S. W. MACADAM AVE.

Jola



Float Switches
Liquid Level Controls and
Immersion Tubes (ex.)

Suitable for liquids of all kinds

Jola-GmbH. • Lambrecht / Pfalz-Germany • Tel. Lambrecht 227
Cable Address: Jola Lambrecht

BEST OF THE CARTOONS
from PAPER TRADE JOURNAL
Edited by John C. W. Evans

Eighty pages of "laughs."
The humorous side of things that happen in paper and pulp mills at one time or another.
Get a copy—it will only cost you $1.25 and where could you get so much enjoyment for so little?
$1.25 per copy Postage Prepaid.

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49 West 45th Street, New York 36, N. Y.

Send postage prepaid, Remittance with order.....copies, *Best of the Cartoons*, Price $1.25;
All New York City Orders are Subject to a City Sales Tax

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Street ..... *City and State* .....
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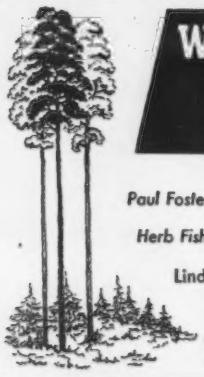

WILLIAMS-GRAY COMPANY
221 North LaSalle Street
Chicago 1, Illinois

Serving the Paper Industry 1906

Paul Foster • Peter Talbot
Herb Fishburn • Wes Gallup • Bill French

Lindsay Wires
Knox Woolen Felts
Mount Vernon Dryer Felts
Carrier Rope, Splicing Tissues, Deckle Webbing, Apron Cloth, Wire Brushes

Another Plant To Serve You

SHIP US IN KALAMAZOO

PACKING PLANTS
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THOMAS PAPER STOCK CO.
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Theo. Adams AND ASSOCIATES,
SPECIAL ENGINEERS

Spiral Paper Core and Paper Tube Winding Machinery

SPECIALISTS IN PAPER CORE AND PAPER TUBE CUTTING PROBLEMS

Also, For Sale

Standard Makes Used, Rebuilt Spiral Winders and Tube Recutters

Sales Department: 2815 Orchard Lane, Wilmette, Illinois Phone Alpine 1-7513

CUT PLANT MAINTENANCE!

Automatic
LUNKENHEIMER OILERS
eliminate costly hand labor!

Fig. 1834 Constant Level Oil Control

Fig. 1815 Globe Body Bottle Oiler

Labor costs are far too high to permit economical hand-oiling—yet valuable bearings must be protected against damage! Install Lunkenheimer Bottle Oilers, Oil Cups, or Constant Level Oil Controls to feed oil automatically—prevent over-supply, leakage, spatter. Request literature from your Lunkenheimer Distributor or write The Lunkenheimer Co., Box 360, Annex Station, Cincinnati 14, Ohio.

Fig. 1500 Sight Feed Oil Cup

L-257-30

LUNKENHEIMER
THE ONE *Great* NAME IN VALVES

TEST TIPS
FROM THE SCOTT LABORATORY

MEASURE INTERNAL BOND STRENGTH
with the Scott Model B Tester

Designed cooperatively by Sisalkraft Corp. and Scott Testers, Inc., the Model B Tester offers a faster and simpler method of determining the internal bond strength of paper products. A unique feature of the Model B on production and research work is that it enables the technician to prepare for accurate testing of *five* samples simultaneously. Each sample is split by the impact of a free-swinging pendulum. Direct reading of test values is indicated on a dial recorder. The tester is supplied complete with fixtures for preparing five samples, and two ranges, 0-.250 and .100-.500 ft. lbs. Get complete facts —write for Model B Brochure. SCOTT TESTERS, INC., 51 BLACKSTONE ST., PROVIDENCE, R. I.

SCOTT TESTERS
THE SURE TEST... SCOTT!

SCOTT TESTERS, Inc., 51 Blackstone Street, Providence, Rhode Island

AMERICAN AND ENGLISH CLAYS
FOR ALL PAPER MAKING PURPOSES
ANGLO-AMERICAN CLAYS CORP.

(Formerly: English China Clays Sales Corporation)

6 East 45th Street, New York 17, N. Y.

PAPER TRADE JOURNAL

CLASSIFIED ADVERTISING RATES

HELP WANTED—$1.50 (6 words to line). Minimum charge $5.00.
SITUATIONS WANTED—$1.50. Minimum charge $5.00. If repeated ½ rate will be charged for each consecutive repetition.
FOR SALE—$1.50 a line. Minimum charge $5.00.
WANTED—$1.50 a line. Minimum charge $5.00.
OPPORTUNITIES—$1.50 a line. Minimum charge $5.00.

Classified Advertising is non commissionable.

Classified advertising space may also be purchased at $8.00 per single column inch. All classified advertisements are payable in advance.

If box number is used—75 cents additional.

Address replies to advertisements appearing under Box Number in care of PAPER TRADE JOURNAL, 49 West 45th Street, New York 19, N. Y.

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PAPER MEN

$5,000 to $50,000

SALES • PRODUCTION • TECHNICAL

Finding and landing THE ONE BEST JOB requires sound analysis, careful planning, proper contacts and skillful negotiation.

Paper men ourselves, and the only recognized professional specialists in the world in our particular field, we assist responsible paper men to accelerate their careers by uncovering and developing THE SPECIFIC SITUATION that most exactly fits the needs of each individual we serve.

If you seek to better yourself, and your performance to date entitles you to our endorsement, we can and will help you. Contact us in absolute confidence for information regarding procedure.

GEO. M. SUNDAY & ASSO.

PERSONNEL CONSULTANTS TO THE PULP, PAPER & ALLIED INDUSTRIES

6 East Monroe, Chicago ANdover 3-1970

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Help Wanted

REQUIRED, at once:

Paper Mill SUPERINTENDENT

(fine paper experience is essential)

to take complete charge of entire "Paper Mill" Division in a large pulp and paper mill in New Zealand producing a wide variety of products including: MF and MG papers; envelope, poster and specialty papers; multiwall bag papers; linerboard; kraft pulp, bleached and unbleached. The mill has three modern paper machines.

To qualify, candidates must have several years experience as "Paper Mill Superintendents" of a large operation similar to that in New Zealand.

This is a senior position. Salary and other terms of employment are sufficiently attractive to merit careful consideration by experienced "Paper Mill Superintendents." Enquiries are invited in confidence; each will be acknowledged promptly. Early interviews.

G. HAROLD FISK, P.Eng. CONSULTANT★
Dominion Square Building, MONTREAL

★ *Consultant . . . to Management seeking Executives, particularly Engineers*

J-25

Help Wanted

WANTED

A BROAD GAUGE PRACTICAL-MINDED

TECHNICAL DIRECTOR

To $12,500 Start

Our client, a well known and highly respected fine and medium fine mill in a delightful section of New England, has just about reached its feasible limits on present grades and needs to expand the line through development of new, profitable specialties.

This assignment calls for a practical rather than a theoretical technician—a profit conscious, down-to-earth fellow, knowledgeable in operating, who not only can develop grades for the mill to make and sell, but also put them on the machines and see to it they are run properly.

Man selected will be a key member of the management team, responsible directly to the president and general manager, a friend of ours of long standing and one of the most splendid gentlemen to be found anywhere in the industry.

Make initial inquiry in writing to G.M. Sunday personally, enclosing picture and comprehensive resume covering vital statistics, education and chronological treatment of background and experience. Full confidence guaranteed. Telephone conference will follow, at which time full details will be revealed and arrangements made for personal interview at client's expense.

SUNDAY, INC.

Personnel Consultants to Management
Pulp, Paper and Allied Industries

6 East Monroe Street **Chicago 3, Ill.** **AN 3-1970**

J-25

Help Wanted advertisements continued on page 52

Help Wanted

WANTED

Executive Sales Engineer

Ambitious, aggressive, under 45 years of management calibre with proven record in machinery sales to paper industry. Successful applicant would become Sales Manager. Reply in confidence with complete resume and salary requirement to:

President
Smith & Winchester Mfg. Co.
South Windham, Conn.

J-25

Help Wanted

PAPER CHEMIST

with mill experience in paper and coating wanted for technical sales service. Willing to travel as required. Send resume, photograph and salary required. Replies will be treated in strict confidence. Address Box 60-117 care Paper Trade Journal.

A-15

ROSS PAPER MACHINERY CO.

265 PASSAIC STREET • NEWARK 4, NEW JERSEY

Cable Address: "JACKROSS Newark: N.Jer" HUMBOLDT 4-8880

CANADA — 199 BAY STREET, TORONTO, ONTARIO SOUTH — P. O. BOX 2065, MOBILE, ALABAMA

SUPPLIERS OF PAPER MACHINERY TO THE WORLD — RPM

BAG MACHINERY
1—S&H 3½" to 10¼" face; 6" to 13" tube pull

BAG MACHINERY—MULTI-WALL
1—S&W 1 to 4 ply tuber; PV, SOM, & POM; 10" to 24" face; 22" to 43" pull; w/15 hp VS drive

BEATERS
2—3000# Downingtown w/60" face x 67" dia roll; like new

CALENDER STACKS
1— 80" P & J 7 roll; heavy duty
2— 82" & 86" Lobdell five roll
1— 96" B-C 6 Roll—heavy duty
1—108" B-C 5 roll
1—104" B-C 8 roll
1—115" B-C 7 roll
2—124" Downingtown 5 roll & 6 roll

CHIPPERS
1— 88" Murray 10 knife w/600 hp motor
1— 96" Murray 6 knife; A-F Brng.

COATERS
1— 24" Waldron Coater & Embosser
2— 40" Chapman Extrusion Type
2— 65" & 76" Mayers

COMPLETE MACHINES
3—Sandy Hill 81" trim single cyl. Tissue
1—M & W 72" Fourdrinier paper machine
1—B-C 100" 2 cyl. Board Machine Complete
1—M & W 72" Yankee Fourdrinier

CYLINDER MOLDS
1— 48" face x 42" dia.
2— 63" face x 36" dia w/rubber couches
1— 78" face x 40" dia.
1—104" face x 36" dia
1—107" face x 48" dia; A-F Brng
8—124" face x 36" dia w/rubber couches
1—131" face x 42" dia; A-F Brng
1—136" face x 54" dia; SS covering

CYLINDER WET ENDS
Downingtown single cylinder; 99" face x 48" dia.; 18" dia. couch

DRYERS—HYDROSTATICALLY TESTED

24" Dia.:
39—46" face; Chrome plated
1—156" face w/gear and steam joint

28" Dia.:
3— 70" face w/gears & bearings
3— 73" face w/gears & bearings
3— 76" face w/gears & bearings
3— 77" face w/gears & bearings
2— 84" face
2— 84" face w/accessories

36" Dia.:
1— 42" face
2— 44" face
2— 46" face
4— 70" face w/gears & bearings
11— 72" face w/gears & bearings
1— 74" face Lukenweld w/A-F Brng
1— 74" face w/gears & bearings
3— 75" face w/gears & bearings
5— 75" face
9— 76" face w/gears & bearings
1— 77" face w/gears & bearings
1— 78" face w/gears & bearings
2— 80" face
5— 84" face
2— 88" face
18— 90" face; complete section
9— 92" face; complete section
1—138" face
10—160" face

42" Dia.:
45— 96" face w/gears, frames & bearings
1—120" face
1—160" face

48" Dia.:
57— 46" face; chrome plated
12— 82" face; complete section
5— 84" face
24—106" face
11—106" face w/gears & bearings
12—110" face w/gears & bearings
10—123" face w/gears, frames & bearings
1—128" face

DRIVES ENCLOSED RIGHT ANGLE
1—Beloit 65 h.p. Ratio 2.88 to 1
4—Jones 65 hp Ratio 4.83 to 1
1—Michigan 92½ h.p. ratio 10.1 to 1
1—Phila. 28 h.p. Ratio 10.56 to 1
1—50 h.p. Reliance VS with MG set & controls
1—Cleveland 47 h.p.—ratio 3 5/9 to 1
1—Cleveland 23.5 h.p.—ratio 3 5/9 to 1

EMBOSSERS
1— 80" Hudson Sharp; A-F Brng
2— 62" Textile Machinery Co; w/drives

EXTRACTOR ROLLS—DOWNINGTOWN
2—139" face x 24" dia.; A-F Brng.
1—128" face x 24" dia.; Complete Section

FLAT SCREENS
1— 4 plate Tailing Screen
2— 12 Plate IMPCO w/Dunbar Drives
8— 14 plate IMPCO—Bronze Vats S.S. Plates

HYDRAPULPER
1—B-C 12 ft. 550 cu. ft. with junker—batch type 150 h.p. 440/3/60 motor. Also Shartle Pump 800 g.p.m., 50 ft. head. All new 1957 —used 1 year

INLETS & HEADBOXES
1—106" Valley w/8" distributing roll
1—131" Valley w/10" distributing roll; SS lined

JORDANS
2—Appleton #1 w/A-F Brng
1—N & W Pony w/75 h.p motors
1—Horne w/AF Brngs
4—Shartle Miami #2 w/A-F Brngs
1—Jones Midget—Used 2 months

MOTORS 3 PH 60 CYCLE
1—100 hp GE; 440 v; 695 rpm
1—250 h.p. West. syn. 440V., 450 r.p.m.
1—300 hp West; 2200 v; 503 rpm
1—350 hp GE; 2200 v; 720 rpm: Synch

PAPER MACHINE DRIVES
1—De Laval 100 h.p. steam turbine w/reducers

PULP MILL EQUIPMENT
1—Lannoye #1 Pulper
1—Murray 2 deck Chip Screen

PUMPS—OPEN IMPELLER
1—Shartle 10 x 20 Duplex
23—Centrifugal Stock and Water Pumps

REELS
1—100" Kohler automatic two arm unwind reel; 60" dia rolls; new condition
1—109" two bowl upright
1—123" Beloit—2 bowl
1—126" Beloit Aldrich surface drive type
1—146" B & S pope type w/Reliance drive

REFINERS
2—Jones Fibremasters—Lava Filling
2—#1 Claflin; A-F Brng
1—24" Bauer Double Disc w/two 50 h.p. motors
1—24" Downingtown Weiner; new

ROLL GRINDERS
1—124" x 30" Farrel w/crowning device
1—208" x 32" Farrel w/crowning device

ROLLS
Distributor—Stainless Steel
2— 8" dia. x 115" face
1— 6½" dia. x 115" face
Couch—Rubber Covered
20 Misc. Sizes Dwngs Available
Press—Rubber or Brass Covered
71 Miscellaneous sizes. Drawings available
Felt—Steel, Brass, Rubber Covered
335 Miscellaneous sizes. Drawings available
Calender—Chilled Iron
72 Miscellaneous sizes. Drawings available

ROTARY SCREENS
5—Bird #3A, Model 100 w/copper vats
1—Jones & Leithwalk copper lined

SHEETERS—WITH BACKSTANDS
1— 50" Finley
6— 56", 60", 66" & 70" Hamblets
1— 60" Hamblet w/overlapping layboy
1— 65" Kidder w/elec. eye and layboy
1— 74" Hamblet w/motor
1— 76" Beloit Duplex
1— 82" Hamblet
1— 85" Hamblet duplex w/layboy
1—105" Hamblet
1—112" Beloit Duplex Board Cutter; A/F Brng

SLITTERS & REWINDERS

17¾"-Maximum Rewind Diameter
1—42" Cameron Type 26-2A

24" Maximum Rewind Diameter
3— 42" Cameron Type 6
1— 42" Cameron Type 6 Shear Cut
1— 62" Cameron Type 8
1— 72" Cameron Type 9-5

30" Maximum Rewind Diameter
1— 52" Cameron Type 10
1— 60" Langston Shear Cut
1— 62" Cameron Type 10
1— 72" Cameron Type 10; A-F Brng
1— 72" Cameron Type 10 Shear Cut; A-F

36" Maximum Rewind Diameter
1— 52" Johnstone Model 14H; A-F Brng.
1— 70" Variable Speed Center Winder
1— 72" Cameron Model 8-10
1— 72" Cameron Type 10; A-F Brng

42" Maximum Rewind Diameter
1— 40" Egan Shear Cut; A-F Brng
1— 60" Kidder Model SH Low Bed
1— 72" Beloit Shear Cut
1— 92" B & S; A-F Brng
1—136" Cameron Type 18; A-F Brng
1—161" Cameron Type 18 w/60 hp Reliance VS Drive

48" Maximum Rewind Diameter
1— 86" M & W Four Drum Shear Cut
1—110" Langston
1—152" Langston Shear Cut

60" Maximum Rewind Diameter
1—112" Cameron Type 18
1—120" M & W two drum w/75 h.p. drive
1—120" Langston
1—136" Langston Type DA Shear Cut; A-F

SLITTERS & REWINDERS—DOUBLE REWIND

18" Maximum Rewind Diameter
2—42" Cameron Type 26-3A
1—52" Cameron Type 26-3A

30" Maximum Rewind Diameter
1—42" Essex Shear Cut; A-F Brng.
1—42" Cameron Type 28-3
1—92" Cameron Type 28-3 w/vari-drive

STOCK CLEANERS
2—1000 g.p.m. Shartle Hydrafuges w/motors
14—Bird Dirtecs; 2" & 6" bronze
1—Bird Dirtec 12". Rebuilt by Bird
21—4" Vortraps—Bronze
3—Bird Centrifiers—Style CFL—S.S. New

STOCK REGULATORS
2—Braemer SS; 25 t/d cap
2—Poirier; 25T/D cap.

SUCTION COUCH ROLLS
1—125" face x 18" dia.—bronze brng.
1—160" face x 30" dia.—roller brng.

SUPERCALENDERS
2— 30" Norwood 4 roll
2— 63" Norwood 8 roll; A-F Brng
1— 92" Norwood 7 roll w/drive

SUCTION EXTRACTOR ROLLS—DOWNINGTOWN
1—105" face x 19" dia.
1—126" face x 22" dia.; complete section
1—134" face x 20" dia.; A-F Brng.

SUCTION PRESS SECTIONS
1—120" face x 18" dia. R.C.—Roller brng.
1—126" face x 24" dia. RC; complete section
1—134" face x 22" dia. Sandusky w/frames, top roll, etc.

TOWEL FOLDER
1—Hudson Sharp Model 81, single fold

TRIMMERS—POWER BACK GAUGES
2— 38" Seybold w/motors
1— 57" Seybold Precision
2— 65", 74" Seybold Daytons

VACUUM PUMPS
8—H-4, ¼H-5, & H-5 Nash
4—L-5 & L-7 Nash
6—#2, #3, #4, #6 & #7 Nash Hytors
1—8 x 10 Connersville
3—MD-2 Nash w/motors; new laboratory models

WASHER-VACUUM
1—Kamyr 8 ft. dia. x 6 ft. face w/Reliance Drive, New 1957. Used 1 year

YANKEE DRYERS
1—132" face x 10' dia Beloit; 35 psi

Help Wanted

Help Wanted

WANTED FOR WORK IN ISRAEL

TOUR BOSSES

FOR MODERN TWO-MACHINE MILL

OPERATING ONE STRAIGHT FOURDRINIER ON FINE AND KRAFT GRADES 30 TO 200 LBS. AND ONE 126" BELOIT FOURDRINIER PICK-UP COMBINED MACHINE WITH PRE-DRIERS AND YANKEE ATTACHMENT PRODUCING LIGHT-WEIGHT PAPERS 10 TO 35 LBS. AT HIGH SPEEDS.

OPERATING EXPERIENCE WITH COMBINED MACHINE IS ESSENTIAL.

EXCELLENT SALARY AND LIVING CONDITIONS ON A CONTRACT BASIS FOR QUALIFIED PERSONNEL.

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P.O. BOX 142, HADERA, ISRAEL S-5

ENGINEERS

Expanding national and international markets necessitate the addition of several well qualified Sales Engineers and Machine Design Engineers to our staff. These are challenging career positions, offering well above average earnings. Thorough knowledge of pulp and paper finishing room machinery and operations required. Submit confidential resume, stating complete personal and professional qualifications to:

LAMB-GRAYS HARBOR CO., INC.

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J-25

Sales Manager

Experienced in Paper, Conversion, Gravure Printing, Embossing, Die Cutting, Packaging and Paper Sales. Not interested in Super Man. Need man with good common sense and lots of imagination and willing to work with old established company near New York City. Address Box 60-157 care Paper Trade Journal.

J-25

SOUTHERN ENGINEERING ORGANIZATION seeks a man interested in the development of a pulp and paper mill design department. Excellent opportunity for an engineer of proven technical and sales ability. Address Box 60-88 care Paper Trade Journal. J-25

WANTED
PLANT ENGINEER

Minimum of 3 to 5 years paper mill experience. Fourdrinier paper machines, 125 ton daily capacity. Located in Midwest. Excellent salary opportunity. Send resume. Replies will be held in strict confidence. Address Box 60-151 care Paper Trade Journal. J-25

Research and Development

Immediate position open in Research and Development Department of absorbent specialty mill located in midwest. Prefer man with degree in chemistry and three years of paper mill experience. Knowledge of saturating papers and saturating resins desirable.

Write to Box #60-135, care of Paper Trade Journal.

J-25

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SUPERINTENDENT

Folding Boxboard. Able assume complete charge one machine Mill. Outline full qualifications, salary expected first letter. Box 60-154, care Paper Trade Journal. A-1

NORTHEASTERN Cylinder Board Mill needs qualified Chemist with some production background and technical experience. Salary open. Address Box 60-152 care Paper Trade Journal. A-22

Situations Wanted

SALESMAN AND CONSULTANT AVAILABLE. Ten years experience operating paper finishing department. Seventeen years selling paper finishing equipment for well known international and national supplier. Right acquaintances, Ohio, Michigan, Wisconsin. Box No. 60-149, care Paper Trade Journal. A-1

For Sale

FOR SALE

60" Waldron micro jet air coater, with air compressor, Reeves motor drive, new 1951.

32" Waldron reverse roll coater with winder and Reeves drive.

2—42" type 6 Camerons, can be inspected while set up operating.

62" ten 10 model 11A Cameron, new 1950, water cooled unwind, still set up as last operated.

84" Seybold Dayton, can be inspected while operating.

84" Seybold precision, can be inspected while operating.

3—Dryers (R.B.) 60" x 55" face, with single deck frame, gears, bearings.

40" Model C Fales with hydraulic lift.

36" Model C Fales with hydraulic lift, new 1951, used about one year.

2—36" Beck.

1—40" Hamblet, still set up, as last operated.

5—Small Lathes, still set up, as last operated, and other machine tools.

112" Duplex Sheet cutter with layboy and 10 roll backstand.

70" Sheet cutter with Moore and White layboy, 10 roll backstand.

62" Camachine type 28-3 BT duplex shear cut slitter, new 1947, with Cameron constant tension unit.

62" Cameron type 8-5.

105" Langston, type CA, anti friction.

52" Type 10 Model 10A Cameron anti friction.

92" Type 10-6 Cameron, anti friction.

48" Cameron, type 6.

45" Cameron, Cellophane slitter, type 26-3A.

152" Type DA Langston.

160" Type 18 Cameron with water cooled unwind, Cameron constant tension unit.

82" Langston, type B, shear cut slitters.

84" Pusey & Jones shear cut slitter, drums 14 x 84".

7 VG 5 PIV units, 4 to 1 ratio.

6 Dryers 48" diameter x 116" face.

Frank H. Davis Company, Inc.
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Help Wanted

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If you have a good knowledge of PAPERMAKING, either from production or technical support experience (or if you have been SELLING to the Paper Industry) you may qualify for a position in FIELD SERVICE with a highly regarded paper mill supplier.

This is a wonderful opportunity to put your knowledge and experience to work in the field you know the best and to get both the financial and professional recognition which you deserve.

Drop us a line telling of your experience and if it fits, you'll be invited to our headquarters—at our expense so that we can get to know each other better. We think you'll like what you see and hear!

Be assured that every precaution will be taken to keep your inquiry confidential. (For the information of men who are now selling to paper mills, our Sales personnel have been informed of this ad.)

Reply Box 60-155 care Paper Trade Journal.

J-25

Wanted

Products and Accounts Wanted: Established manufacturers agency with trained pulp and paper mill specialists and offices in all principal areas of U.S. and Canada wants specialty equipment to sell on commission basis. Can also arrange for manufacture of your products or inventions.

DeZurik Sales Company
260 Bellevue Ave.
P.O. Box 828
Upper Montclair, New Jersey

J-25

Tissue Mill Requires:

1—Suction Press, width of drilled face 156", complete with top roll, press frames, loading devices, etc.
1—Tissue Calender, two roll, roll face 156".
1—Suction Press, width of drilled face about 108", other details as above.
1—Fourdrinier complete, wire width 108", suitable for use on tissue machines, including plain couch roll and top couch roll, operating speed 1200 fpm.
1—Tissue Calender, two roll, roll face 108".

Reply Box 60-156 care Paper Trade Journal.

A-1

For Sale

FOR RPM SALE

"HYDRAPULPER"

B-C 12 ft. batch type with junker, 150 h.p., 44/3/60 motor, Shartle Pump with motor.

New 1957. Used 1 year.

ROSS PAPER MACHINERY COMPANY
265 Passaic St., Newark 4, N. J.
Phone: HUmboldt 4-8880

A-1

FOR SALE
BARGAIN PRICES

1—110" S.S. Head Box. Complete with Flow Rolls and Stands.
1—110" Pope Reel. B. & S.
1—111" Size Press, A.F. Bearings. B. & S. Spare Rolls.
2—Imco, Standard Deckers, Design #6. 40" Dia. x 96" Cylinder Mold, Steel Tank, C.I. Ends. 10" Inlet, 12" Discharge. Couch Rolls—24" Dia. x 97" Face. Roller Chain Drive.
1—Miami #2 Jordan, New S. S. Fillings.
1—Miami #1 Jordan, C. I. Fillings.
1—E. D. Jones Majestic Jordan, S. S. Fillings.
2—K-5 Nash Vacuum Pumps.
1—45" Seybold Dayton Trimmer.
1—65" Seybold Dayton Trimmer.
1—75" Seybold 20th Century Trimmer.

The above machinery is in excellent condition and we can quote you very low prices.

WRITE—WIRE—PHONE
RUDERMAN MACHINERY EXCHANGE
GOUVERNEUR, NEW YORK
Telephone 333 - 334 TF

FOR SALE

2—Dilts keyed bandless Beater Rolls 66" dia. 54" face complete with lighter stands, new bars, new tub, up to 2500# capacity.
1—Dayton Beater & Hoist, bandless roll 62" x 60" face, complete with tub and stands.
2—67" x 60" E. D. Jones Basalt lava filled rolls, forged steel spindles (like new).
1—New Dilts keyed bandless roll 60" dia. 48" face, forged steel spindle, 66 new fly bars.
2—New 48" dia. 48" face Dilts keyed bandless rolls, 60 bars. Never used.
1—Noble & Wood Mammoth Jordan, stainless steel fillings, A.F. bearings on thrust end.
2—Emerson No. 1 Jordans, good fillings.
1—E. D. Jones Standard Jordan.
2—E. D. Jones Majestic Jordans, one with new fillings, one with good bronze fillings.
1—106" Cameron 18 Winder, will make 60" dia. roll.
1—126" Beloit Slitter and Winder.
1—82" Langston Slitter and Winder, will make 50" dia. rolls.
1—44" Camachine for 28" maximum dia. rolls.
1—42" Langston Rewinder 26" dia. rolls.
1—74" Bagley & Sewall 2-drum Winder 44" rolls.
2—42" x 96" Bagley & Sewall Deckers.
5—36" x 96" Cylinder Moulds complete with vats and couch rolls.
1—112" Bagley & Sewall Pope type Reel, new in 1956.
1—110" Rice-Barton Pope type Reel, A.F. bearings.
1—Bird 5A Saveall, fully reconditioned. Very good.
6—42" dia. 116" face Downingtown Dryers.
12—36" dia. 72" face Sandy Hill Dryers.
5—36" x 72" face Downingtown Dryers ASME stamped.
12—48" x 152" Rice-Barton Dryers.
5—48" x 86" Bagley & Sewall Dryers.
1—60" x 96" Rice-Barton Yankee Dryer.
1—10' x 132" Beloit Yankee Dryer.
2—H-5 Nash Vacuum Pumps.
1—No. 6 Nash Hytor Vacuum Pump.
2—No. 2 Nash Hytor Vacuum Pumps.
4—No. 1 Nash Hytor Vacuum Pumps.
1—18" dia. 126" drilled face Suction Press Roll.
1—15" dia. 86" drilled face Suction Press Roll.
1—24" dia. 124" drilled face Suction Couch Roll.
1—18" dia. 126" drilled face Suction Couch Roll.
2—Bird 2A Rotary Screens, Plates cut .022.
2—Bird 3A Rotary Screens with new S.S. vats, stainless steel plates cut .014, all bronze cylinders, fully reconditioned, like new.
5—10-Plate Sandy Hill Flat Screens, roller shoes.
1—12-Plate Sandy Hill Flat Screens, S.S. tops, roller shoes.
1—80" Moore & White Single Rotary Sheeter with backstands.
1—104" Hamblet Rotary Sheet Cutter with backstands.
3—Falk Speed Reducers Type A, Size 50, HP 28 at 550 RPM.
2—Cleveland Worm Gear Angle Reducers, Ratio 12 to 1, Class 3 at 1160 RPM, 17 HP.
2—Cleveland Worm Gear Angle Reducers Ratio 12 to 1, 5 HP at 1800 RPM.
1—Reeves Drive Size 7, with extra belt.
1—Reeves Drive Size 4, new in 1954.
1—Cameron Centrifugal Pump 3000 GPM, 45' head.
1—Gould Centrifugal Pump 2500 GPM, 90' head.
1—Gould Centrifugal Pump 2100 GPM, 36' head.
1—Frederick Centrifugal Pump 2800 GPM, 115' head.
1—Gould Centrifugal Pump 1000 GPM, 76' head.
2—Deming Centrifugal Pumps 1200 GPM, 40' head.
2—Deming Centrifugal Pumps 460 GPM, 30' head.
2—Kingsford Stock Pumps 300 GPM, 110' head.
2—Kingsford Stock Pumps 1500 GPM, 115' head.

Over 100 pumps all sizes and specifications everyone guaranteed.

5—New Felt Stretch units complete with 1-7/16" Acme Thread, with eccentrics and handwheel also ratchet for tightening.

We have dismantled 5 complete paper mills in last 18 months and have a large miscellaneous stock to choose from.

We invite inspection and would be glad to have you as our guests. It would pay you to come and see us.

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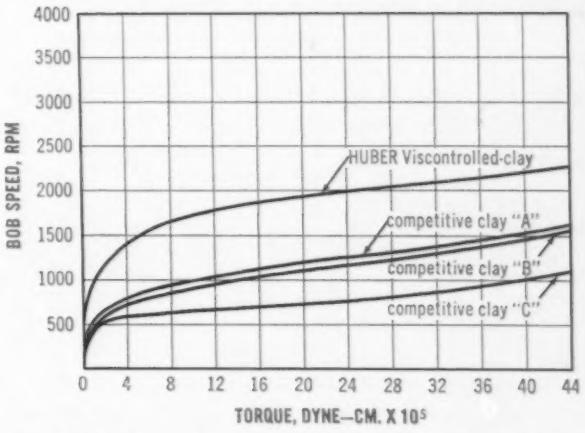

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